CSERIAC-RA-97-003C

Review & Analysis

Expanded Air Force Physical Fitness Battery: Muscle Strength, Muscle Endurance, and Flexibility Considered

Volume III, Copyrighted Literature Search Results

Prepared for: OFFICE FOR PREVENTION AND HEALTH SERVICES ASSESSMENT
ARMSTRONG LABORATORY
BROOKS AIR FORCE BASE, TEXAS

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30 October 1997

REPORT DOCUMENTATION PAGE

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11. SUPPLEMENTARY NOTES
This report contains three volumes. Volume I is the final report on issues relevant to the Air Force's consideration of strength and flexibility as additions to the Air Force Fitness Program. Volume II contains pertinent non-copyrighted citations extracted from government databases, and Volume III contains pertinent copyrighted citations extracted from commercial databases. A Table of Contents for the three-volume set may be found in Volume I.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
DISTRIBUTION STATEMENT C: Distribution authorized to the US Government Customer only (proprietary [copyrighted] information), 30 October 97. Requests for similar searches shall be referred to: Crew System Ergonomics Information Analysis Center (CSERIAC), AL/CFH/CSERIAC Bldg 248, ATTENTION: Information Specialist, 2255 H Street, Wright-Patterson AFB, OH 45433-7022

12b. DISTRIBUTION CODE
C

13. ABSTRACT ***(Maximum 200 Words)***

This is the third volume of a three volume set. It contains pertinent copyrighted citations and abstracts extracted from various commercial databases. Volume I is the final report on issues relevant to the Air Force's consideration of strength and flexibility as additions to the Air Force Fitness Program and Volume II contains pertinent non-copyrighted citations extracted from government databases. A Table of Contents for the three-volume set may be found in Volume I. Requests for an updated literature search should be referred to: Crew System Ergonomics Information Analysis Center (CSERIAC), AL/CFH/CSERIAC Bldg 248, ATTENTION: Information Specialist, 2255 H Street, Wright-Patterson AFB, OH 45433-7022

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NOTICE

This report contains three volumes. Volume I is the final report of issues relevant to the Air Force's consideration of strength and flexibility as additions to the Air Force Fitness Program. Volume II contains pertinent non-copyrighted citations extracted from government databases, and Volume III contains pertinent copyrighted citations extracted from commercial databases. A Table of Contents for the three-volume set may be found in Volume I.

VOLUME III
COPYRIGHTED CITATIONS
TABLE OF CONTENTS

1. INTRODUCTION

In support of the USAF Office for Prevention and Health Services Assessment, the Crew System Ergonomics Information Analysis Center (CSERIAC) conducted an extensive search of scientific literature to determine state-of-the-art issues and solutions related to the benefit to the Air Force of adding strength and flexibility to their fitness standard. This volume contains the literature search results from selected copyrighted databases.

2. DATABASES SEARCHED

The following databases were searched and the results presented in this volume.

- National Aeronautics and Space Administration Remote Console (NASA Recon)
- ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT (AGARD)
- DISSERTATION ABSTRACTS ONLINE
- SPORTDiscus

3. ORDERING DOCUMENTS

Most of the documents identified in this search can be obtained through local resources, such as city, university, or company libraries or through inter-library loan programs sponsored by these libraries. However, some of these documents may be available only through special organizations, such as the Defense Technical Information Center (DTIC), National Technical Information Service (NTIS), or other commercial document vendors.

3.1 Defense Technical Information Center (DTIC)

DTIC is the central repository for documents resulting from research supported by the Department of Defense (DoD). DTIC maintains Technical Report (TR) and Work Unit Information Summary (WUIS) databases.

Documents from the DTIC TR database (including documents from the DTIC CD-ROM) are identified by an accession number that begins with "AD," such as AD-A123 456. Most of these documents are available through DTIC. Some of the documents may not be available through DTIC; however, the citations for these documents contain the necessary document acquisition information.

The DTIC WUIS database contains summaries of on-going research. Unlike the TR database, the WUIS database does not contain abstracts for documents that can be obtained through DTIC or any other source. Instead, most of these summaries will provide you with point-of-contact information for the principal investigator or contract monitor associated with a cited work unit.

To order DTIC documents, organizations must have a deposit account established with the National Technical Information Service (NTIS, see below), against which document ordering fees will be charged. Call DTIC if you do not have information on establishing a deposit account with NTIS. When ordering documents from DTIC, please cite your DTIC User Code.

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NTIS is a major source for US and foreign government-sponsored research documentation. Orders for NTIS documents can be charged to an NTIS Deposit Account, American Express, Visa, or MasterCard. For additional information on establishing a deposit account, you may contact NTIS directly at (703) 487-4064. NTIS document orders may be placed using the following information:

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http://www.fedworld.gov/ntis/ntishome.html

3.3 Crew System Ergonomics Information Analysis Center (CSERIAC)

We recommend that you discuss potential document orders with your in-house or local technical information specialist. He or she will know the most appropriate method to place orders for documents identified in this report. If questions do arise, please feel free to contact the Crew System Ergonomics Information Analysis Center (CSERIAC) at the address below. Also, if you desire, we can provide you with a copy of the CSERIAC Catalog which contains a listing of the human factors-related publications distributed by CSERIAC.

AL/CFH/CSERIAC
2255 H Street, Bldg. 248
Wright-Patterson AFB, OH 45433-7022
Phone: (937) 255-4842
FAX: (937) 255-4823
Email: cseriac@al.wpafb.af.mil
http://www.dtic.mil/iac/cseriac/cseriac.html

4. COPYRIGHTED LITERATURE RESULTS

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4.1 Advisory Group for Aerospace Research & Development (AGARD)

AGARD - FITNESS

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86N30309# ISSUE 21 PAGE 3349 CATEGORY 52 ***RPT#***: AGARD-CP-396 ISBN-92-835-0385-6 AD-A166557 85/12/00 146 PAGES In ENGLISH and FRENCH UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Medical Selection and Physiological Training of Future Fighter Aircrew

CORP: Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). ***CSS***: (Aerospace Medical Panel.)

SAP: Avail: CASI HC A07/MF A02

CIO: France Conference Held In Athens, Greece, 25-26 Apr. 1985------

MAJS: /*Aircraft Pilots/*Cardiovascular System/*Fighter Aircraft/*Gravitational Effects/*Physical Fitness/*Pilot Selection/*Visual Perception

MINS: / Computer Techniques/ Physiological Tests/ Pilot Performance/ Psychological Tests/ Target Acquisition

ANN: The conference proceedings reviewed and made recommendations with respect to the medical selection and physiological and physical training of pilots who are to operate future fighter aircraft. The relevant characteristics of a proposed USAF fighter and the European Fighter Aircraft were discussed and used as the basis for selection and training considerations. Contributors drew upon the experience of the medical selection of pilots for present fighter aircraft. The cardiovascular, vision, and vertebral column aspects of medical selection and monitoring are considered in depth and recommendations made as to the methods which should be employed in the future. The influence of physical** fitness** upon pilot performance is addressed. The philosophy and practice of physiological training of aircrews is reviewed with emphasis on the value of the human centrifuge in teaching G protective maneuvers. For individual titles see N86-30310 through N86-30327.

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84N21082# ISSUE 11 PAGE 1699 CATEGORY 52 ***RPT#***: AGARD-AG-277(E) ISBN-92-835-1464-5 AD-A138965 83/12/00 213 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Non-invasive methods of cardiovascular exploration in aerospace medicine

AUTHORS: A/Carre, R.; B/Amoretti, R.; C/Coignard, A.; D/Colin, J.; E/Didier, A. ; F/Droniou, J.; G/Gaillard, J. F.; H/Hiltenbrand, C.; I/Ille, H.; J/Lantrade, P. ***PAA***: A/(Centre Principal d'Expertise Medicale du Personnel Navigant de l'Aeronautique)

CORP: Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). AVAIL.CASI

SAP: Avail: CASI HC A10/MF A03

CIO: France------

MAJS: /*Aerospace Medicine/*Cardiography/*Cardiology/*Cardiovascular System/* Exercise Physiology/*Flight Crews/*Fluoroscopy/*Physical Examinations/* Physical Fitness

MINS: / Acceleration Stresses (Physiology)/ Arrhythmia/ Bioelectricity/ Certification/ Diagnosis/ Display Devices/ Heart Diseases/ Hemodynamics/ Lower Body Negative Pressure/ Medical Equipment/ Prognosis/ Symptomology/ Tolerances (Physiology)

ANN: Noninvasive methods of cardiography used in determining flight** fitness** for flight personnel were examined. These methods include standard electrocardiogram and cardiac radiography analysis of heart abnormalities, continuous electrocardiograph monitoring, study of ventricular pre-excitations syndromes, X ray fluorescence of the cardiovascular system, and information on the exercise electrocardiogram. The merits of each technique as it applies to aerospace medicine in general and flight crew** fitness** in particular is discussed. For individual titles, see N84-21083 through N84-21097.

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82N29870# ISSUE 20 PAGE 2871 CATEGORY 52 ***RPT#***: AGARD-AG-250(ENG) ISBN-92-835-1415-7 AD-A115369 82/02/00 338 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Physiopathology and pathology of spinal injuries in aerospace medicine

AUTHORS: A/Delahaye, R. P.; B/Auffret, R.

CORP: Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). AVAIL.CASI

SAP: Avail: CASI HC A15/MF A03

CIO: France------

MAJS: /*Aerospace Medicine/*Back Injuries/*Biodynamics/*Human Pathology/* Physiology/*Spine

MINS: / Aircraft Pilots/ Anatomy/ Crash Injuries/ Ejection Injuries/ Embryology/ Flight Fitness/ Flight Stress (Biology)/ Law (Jurisprudence)/ Physical Examinations/ Posture/ Radiology

ANN: The anatomy and biomechanics of the spine are reviewed and spinal stress in flight is described. The aetiology and pathogenesis of spinal fracture; the clinical examination and radiology of spinal trauma; postural disorders of helicopter and combat aircraft pilots; and flight** fitness** are considered. Medico-legal aspects of spinal disorders, including intervertebral arthritis, spondylolisthesis, and inflammatory rheumatic conditions are addressed. For individual titles, see N82-29871 through N82-29892.

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81N22688*# ISSUE 13 PAGE 1806 CATEGORY 52 ***RPT#***: NASA-TM-75791 AGARD-CP-225 ***CNT#***: NASW-3199 80/06/00 8 PAGES UNCLASSIFIED DOCUMENT Translation was announced as N79-19634

TITLE: Radiological examination of the spine and fitness for work as a helicopter pilot

AUTHORS: A/Delahaye, R. P.; B/Auffret, R.; C/Metges, P. J.

CORP: National Aeronautics and Space Administration, Washington, DC. AVAIL.CASI

SAP: Avail: CASI HC A02/MF A01

CIO: France Transl. By Kanner (Leo) Associates, Redwood City, Calif. ---- Original-- Doc. Prep. By Aerospace Research And Development, Paris Transl. Into ENGLISH Of ‘‘‘Examen Radiologique Du Rechis Et Aptitude A l’Emploi De Pilot d’Helicoptere’’ Rept. AGARD-CP-255, Paris, Dec. 1978 P 56-1-56-7

MAJS: /*Aircraft Pilots/*Flight Fitness/*Physical Examinations/*Radiology/*Spine

MINS: / Musculoskeletal System/ Qualifications/ Vertebrae/ X Ray Analysis

ABA: Author

ABSTRACT: On the matter of spinal fitness for piloting, standards are proposed that suit the critical spinal segments proper to different jobs. Involved here are primarily pilots of combat airplanes and of helicopters. Fitness for one of these does not necessarily mean fitness for the other.

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79N20729# ISSUE 11 PAGE 1475 CATEGORY 52 ***RPT#***: AGARD-AR-131 ISBN-92-835-1307-X AD-A066877 79/01/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Technical evaluation report on the Aerospace Medical Panel London Specialists' Meeting, Fall 1977 --- disease prevention, flight fitness, and findings in cardiology and pulmonary function

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: France Meeting Held At London, 24-28 Oct. 1977------

MAJS: /*Aerospace Medicine/*Cardiology/*Diagnosis/*Flight Fitness/*Medical Science/*Pulmonary Functions

MINS: / Cardiovascular System/ Clinical Medicine/ Diseases/ Flight Crews/ Physical Examinations/ Prevention

ANN: Methods for early disease detection are required to assure optimum air crew selection criteria and to maintain air crew effectiveness in an increasingly stressful environment. A universal approach to a basic framework for developing prospective medicine programs is far from being defined. Yet, prospective medicine proves of value in risk identification and intervention. Examination techniques for the assessment of cardiopulmonary diseases of flying personnel still shows deficiencies, problems, and the need for further research and development to help solve this important health problem. For individual titles, see N79-20730 through N79-20731.

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79N11705# ISSUE 2 PAGE 229 CATEGORY 52 ***RPT#***: AGARD-CP-232 ISBN-92-835-0221-3 AD-A059897 78/09/00 170 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Specific Findings in Cardiology and Pulmonary Function with Special Emphasis on Assessment criteria for Flying

AUTHORS: A/Lancaster, M. C. ***PAA***: A/(School of Aerospace Med., Brooks AFB, Tex.) ***PAT***: A/ed.

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A08/MF A02

CIO: FRANCE Presented At Aerospace Med. Panel's 34th Panel------ Meeting/Specialists Meeting, London, 24-28 Oct. 1977

MAJS: /*Aerospace Medicine/*Cardiovascular System/*Flight Crews/*Pilots (Personnel)/*Pulmonary Functions/*Respiratory System

MINS: / Biomedical Data/ Cardiology/ Electrocardiography/ Electrophysiology/ Flight Stress (Biology)/ Heart Diseases/ Physical Fitness/ Physiological Tests/ Pilot Selection

ANN: Cardiopulmonary disease among military and flight personnel is discussed in terms of premature disability. Data on normal values, natural history, performance of testing methods, assessment of newer techniques for disease detection and definition as well as

philosophies of determination of** fitness** to fly are presented. For individual titles, see N79-11706 through N79-11726.

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78N15688# ISSUE 6 PAGE 793 CATEGORY 52 ***RPT#***: AGARD-AG-213(ENG) AGARDOGRAPH-213(ENG) ISRN-92-835-1265-0 AD-A056992 77/11/00 124 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Comparative study of regulations on standards of medical fitness for flying duties in nine air forces covering seven NATO countries

AUTHORS: A/Evrard, E.

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A06/MF A02

CIO: France------

MAJS: /*Armed Forces (Foreign)/*Armed Forces (United States)/*Flying Personnel/* Physical Fitness

MINS: / Aerospace Medicine/ Medical Science/ Regulations/ Standards

ABA: Author

ABSTRACT: Comparisons were made of current standards for assessing fitness for flying duties in the Armed Forces of seven NATO nations. Regulations used were provided by Belgium, France, Canada, Britain, Norway, the Federal Republic of Germany, and the United States. The study was done to provide medical officers in each of the allied countries with the main texts, recommendations and provisions applicable to military aircrews of the others, and to initiate a review of ideas and doctrines used in assessing medical fitness.

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77N19731# ISSUE 10 PAGE 1355 CATEGORY 51 ***RPT#***: AGARD-CP-203 ISBN-92-835-0186-1 AD-A036670 77/01/00 113 PAGES in ENGLISH; partly in FRENCH UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Recent advances in space medicine

AUTHORS: A/Colin, J. ***PAT***: A/ed.

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A06/MF A02

CIO: France Conf. Proc Of The Aerospace Medical Panel Specialists'---- Meeting,-- Athens, 20-24 Sep. 1976

MAJS: /*Aerospace Medicine/*Space Shuttles/*Spacelab/*Technology Utilization

MINS: / Astronaut Performance/ Biometrics/ Physiological Effects/ Space Flight Stress/ Weightlessness Simulation

ANN: Some of the topics discussed are: the effect of free fall on the vestibular organ and of its post flight readaptation as part of the shuttle program; successful transfer of adaptation aquired in a slow rotation room to motion environments in Navy flight training; environmental investigations on motion sickness susceptibility; and space mission simulation. The significance of physical** fitness** in selection and training of spacelab crews; and the psychometric characteristics of astronauts are also reviewed.

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76N19789# ISSUE 10 PAGE 1299 CATEGORY 52 ***RPT#***: AGARD-CP-182 ISBN-92-835-1208-1 AD-A023915 76/02/00 70 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The use of in-flight evaluation for the assessment of aircrew fitness

AUTHORS: A/Ward, C. L. ***PAA***: A/(Army Med. Res. and Develop. Command, Washington, D. C.) ***PAT***: A/ed.

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: France Presented At Aerospace Med. Panel Specialists Meeting,---- Ankara, 24-- Oct. 1975

MAJS: /*Flight Crews/*Flight Fatigue/*Flight Fitness/*Flight Tests

MINS: / Bioinstrumentation/ Biomedical Data/ Flight Safety/ Flight Simulation/ Flight Stress (Biology)/ Flight Surgeons/ Physical Examinations

ANN: Various aspects of in-flight determinations of physical, psychological, physiological and bioaeronautical suitability and fitness of aircrew are presented. These include some in-flight and simulation techniques, examination methods, bioinstrumentation and procedures for fitness studies as well as results of assessment of the ability to fly safely with orthopedic injuries, amputations, and visual deficiencies, plus a few other physiolocial and psychological situations. Also included are assessments of paratroopers and nonpilot aircrew in their performance of duty. For individual titles, see N76-19790 through N76-19796.

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75N29736# ISSUE 20 PAGE 2563 CATEGORY 52 ***RPT#***: AGARD-AG-210 AGARDOGRAPH-210 75/05/00 65 PAGES UNCLASSIFIED DOCUMENT

TITLE: Treadmill exercise testing at the USAF School of Aerospace Medicine: Physiological responses in aircrewmen and the detection of latent coronary artery disease

AUTHORS: A/Froelicher, V. F.; B/Yanowitz, F.; C/Thompson, A. J.; D/Lancaster, M. C. ***PAA***: A/(School of Aerospace Med.); B/(School of Aerospace Med.); C/(School of Aerospace Med.); D/(School of Aerospace Med.)

CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: France------

MAJS: /*Flight Crews/*Heart Diseases/*Treadmills

MINS: / Aerospace Medicine/ Human Performance/ Physical Fitness/ Stress (Physiology)

ANN: Despite the selective nature of the USAF flying population, coronary heart disease is the leading disease cause of death, disability and removal from flying duties. The purpose is to present the experience of the United States Air Force School of Aerospace Medicine (USAFSAM) in the use of treadmill exercise for evaluating asymptomatic aircrewmen. The monograph consists of separate studies involving aspects of treadmill testing experience at the USAFSAM including descriptions of techniques. For individual titles, see N75-29737 through N75-29738.

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75N24297# ISSUE 15 PAGE 1856 CATEGORY 51 ***RPT#***: AGARD-CP-153 75/03/00 100 PAGES In ENGLISH; partly in FRENCH UNCLASSIFIED DOCUMENT

TITLE: Medical requirements and examination procedures in relation to the tasks of today's aircrew: Comparison of examination techniques in neurology, psychiatry and psychology with special emphasis on objective methods and assessment criteria
AUTHORS: A/Oberholz, H. ***PAA***: A/(Flugmedizinisches Inst. der Luftwaffe, Fuerstenfeldbruck, West Germany) ***PAT***: A/ed.
CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI
SAP: Avail: CASI HC A05/MF A02
CIO: France Presented At The Aerospace Medical Panel Meeting,-- Naples,-- 16-20-- Sep. 1974
MAJS: /*Conferences/*Flight Fitness/*Military Psychology/*Neurology/*Physical Examinations/*Psychiatry
MINS: / Electroencephalography/ Multivariate Statistical Analysis/ Pilot Performance/ Psychological Factors
ANN: Papers presented at the conference are given. Topics discussed include Rorschach tests, computer measurement of complex performance, nonvisual task processing, pulse wave velocity and psychophysiological reaction patterns, catecholamine excretion from air cadets, flight** fitness,** fast analytical techniques for the EEG, impact of multivariate analysis on the aviation selection, psychic health and flying** fitness** examinations, and military aviation psychiatry and neurology. For individual titles, see N75-24298 through N75-24309.

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74N13784# ISSUE 5 PAGE 494 CATEGORY 4 ***RPT#***: AGARD-CP-129 73/10/00 152 PAGES In ENGLISH and FRENCH UNCLASSIFIED DOCUMENT
TITLE: Pathophysiological conditions compatible with flying
AUTHORS: A/Fuchs, H. S. ***PAA***: A/(German Fed. Armed Forces, Bonn) ***PAT***: A/ed.
CORP: Advisory Group for Aerospace Research and Development, Paris (France). AVAIL.CASI
SAP: Avail: CASI HC A08/MF A02
CIO: France Presented At Agard Aerospace Med. Panel Specialist---- Meeting,-- Pensacola, Fla., 16-17 May 1973
MAJS: /*Aerospace Medicine/*Conferences/*Flight Fitness/*Flying Personnel/*Human Pathology
MINS: / Age Factor/ Clinical Medicine/ Flight Hazards/ Heart Diseases/ Military Aviation/ Physical Examinations/ Pilot Selection/ Standards
ANN: Medical selection and maintenance procedures for aircrews are reported. The effects of ageing, flight stress, clinical and psychophysiological pathological factors on pilot flight** fitness** are considered.

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73N23057# ISSUE 14 PAGE 1610 CATEGORY 4 ***RPT#***: AGARD-CP-110 73/02/00 77 PAGES UNCLASSIFIED DOCUMENT
TITLE: Current status in aerospace medicine
UNOC: Aerospace medicine research, including human tolerance to various stress factors - conferences
AUTHORS: A/Jones, W. L. ***PAA***: A/(NASA, Washington, D. C.) ***PAT***: A/ed.

CORP: Advisory Group for Aerospace Research and Development, Paris (France).
AVAIL.CASI
SAP: Avail: CASI HC A05/MF A01
CIO: France Presented At Aerospace Med. Panel Specialist Meeting,---- Glasgow,-- Scotland, 7-8 Sep. 1972
MAJS: /*Aerospace Medicine/*Conferences/*Human Tolerances
MINS: / Diseases/ Ejection/ Flight Fitness/ Italy
ANN: Proceedings from an aerospace medicine conference are presented, emphasizing human tolerances to various stress factors incurred during flight. The diseases, syringomyelia and hepatitis, are considered in terms of their effect on the flying** fitness** of personnel. Compound breeding of Rhesus monkeys is included.

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73N21102# ISSUE 12 PAGE 1368 CATEGORY 4 ***RPT#***: AGARD-CP-108 73/02/00 154 PAGES Partly in ENGLISH; partly in FRENCH UNCLASSIFIED DOCUMENT
TITLE: The use of medication and drugs in flying personnel
UNOC: Conference on detection, evaluation, and identification of drugs and alcohol in flying personnel and effects on flight fitness
AUTHORS: A/Fuchs, H. S. ***PAT***: A/ed.
CORP: Advisory Group for Aerospace Research and Development, Paris (France).
AVAIL.CASI
SAP: Avail: CASI HC A08/MF A02
CIO: France Proc. Of Aerospace Med. Panel Specialist Meeting,---- Glasgow, 5-6-- Sep. 1972
MAJS: /*Alcohols/*Conferences/*Drugs/*Flight Fitness/*Flying Personnel
MINS: / Aerospace Medicine/ Biological Effects/ Central Nervous System Depressants/ Chemotherapy/ Clinical Medicine/ Narcotics/ Pilot Performance / Sleep Deprivation/ Toxic Hazards
ANN: Drug effects on flight fitness and the evaluation, detection, and identification of drugs and alcohol in flying personnel are discussed.

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71N22301# ISSUE 11 PAGE 1687 CATEGORY 5 ***RPT#***: AGARD-CP-81-71 71/03/00 173 PAGES UNCLASSIFIED DOCUMENT
TITLE: Physical fitness in flying including the aging and aged aircrew
UNOC: Physical fitness of flying personnel and aging effects on flight crew performance
AUTHORS: A/Kirchhoff, H. W. ***Pan***: (Aaed.)
CORP: Advisory Group for Aerospace Research and Development, Paris (France).
AVAIL.CASI
SAP: Avail: CASI HC A08/MF A02
CIO: France Presented At The Specialist Meetings Of The Aerospace---- Med. Panel-- Of Agard, Garmisch Partenkirchen, West Germany, 21-22 Sep. 1970
MAJS: /*Aerospace Medicine/*Aging (Biology)/*Conferences/*Flight Crews/*Flight Fitness/*Heart Diseases/*Physical Exercise/*Physical Fitness/*Pilot Performance
MINS: / Aircraft Pilots/ Armed Forces/ Armed Forces (Foreign)/ Cardiovascular System/ Flying Personnel/ Physiological Tests

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4.2 Dissertation Abstracts On-line

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Sets selected:

Set	Items	Description
1	0	PHYSICAL FITNESS
2	2530	AEROBIC? ?
3	474	S2(3W)(EXERCISE OR FITNESS)
4	47	STRENGTH AND S3
5	7675	FLEXIBILITY
6	13	S5 AND S3
7	217	STRENGTH(3N)TRAINING
8	783	PHYSICAL()FITNESS
9	50	7 AND S8
10	5	S7 AND S8
11	2	BENEFIT? ?(3W)S7
12	22	COMPARISON AND S7

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Dissertation Abstracts Online
01491242 ***ORDER NO***: AADAA-I9621016
TITLE: Women And Strength Training: Meaning And Purpose, A Qualitative Investigation Of Women's Experiences (Wieght Training)
AUTHOR: Berman, Sandra Jean
DEGREE: PH.D.
YEAR: 1995
CORPORATE SOURCE/INSTITUTION: University Of California, Berkeley (0028)
CHAIR: Patricia A. Morgan
SOURCE: Volume 57/03-B Of Dissertation Abstracts International. Page 1738. 235 Pages
DESCRIPTORS: Health Sciences, Public Health; Education, Physical; Women's Studies; Psychology, Personality
This research explores The Phenomenological Aspects Of Women's Experiences In A Strength Training Environment. The Study Utilizes In-Depth Interviews, Participant And Non-Participant Observation, Focus Groups, Journals, And Surveys. Sixteen Women, Aged 20-56, Were Recruited From Coeducational And "Recommended For Women" (RFW) Strength Training Classes At A Junior College. These Students And Four Instructors Of Strength Training Classes Were Interviewed Or Participated In Focus Groups. Student Participants Also Kept Activity Journals And Completed A Survey. Results Suggest That Women Enroll In A Strength Training Class For Five Basic Reasons: To Lose Weight, To Shape The Body, To Maintain Or Improve Health, To Gain Strength, And To Slow The Aging Process. Respondents Under Thirty Years Of Age Want To Lose Weight, Shape The

Body, And Build Strength While Respondents Over Thirty Also Want To Improve Or Maintain Health And Slow The Aging Process. Healthy Lifestyle Choices, Such As Increased Exercise And Better Eating Habits, Are Important To Most Women In The Study. Three Major Themes To Emerge From Interview And Focus Group Data Were: (1) Women's Concerns With Their Body Weight, (2) A Sense Of Well-Being Associated With Participation In Strength Training, And (3) The Influence Of The Learning Environment On Women Students. All Student Respondents Report That They "Feel Better" Because Of Participation In Strength Training Class Itself Or In Conjunction With Aerobic Exercise. Although Women Come To The Weight Room To Alter Their Physical Appearance, The Psychological Benefits They Reap Are Oftentimes More Important Than The Physical Benefits. Women Cite A Myriad Of Psychological, Emotional, And Spiritual Benefits From Participation In Strength Training And Physical Activity. Especially Evident Was An Increase In Self Esteem. Many Women Still Fear "Bulking Up" And Perceive Strength Training As A Male Preserve. The Learning Environment (I.E., Socio-Cultural Factors, Physical Attributes, Gender Mix Of Class, Men And Women Instructors) Can Be Important To The Enjoyment And Comfort Level Of Women Students. The RFW Class Provides A Non-Threatening, Noncompetitive Atmosphere Conducive To Learning And Enjoying The Activity. Social, Cultural, And Environmental Restrictions On Women's Participation In Strength Training Negatively Impact Health And Well-Being.

******

Dissertation Abstracts Online

01452883 ***ORDER NO***: AADAA-I9543294

TITLE: Effects Of Scientific Weight Training And Muscle Building Nutrition On Self-Reports Of Mild To Moderate Depression

AUTHOR: Pendola, David P.

DEGREE: ED.D.

YEAR: 1995

CORPORATE SOURCE/INSTITUTION: United States International University (0239)

SOURCE: Volume 56/09-A Of Dissertation Abstracts International. Page 3513. 373 Pages

DESCRIPTORS: Education, Educational Psychology; Health Sciences, Nutrition; Psychology, Experimental; Education, Physical; Psychology, Physiological

This multiple baseline Across Subjects Design With Repeated Measures Experiment Was Conducted To Examine The Effects Of Scientific Weight Training With Proper Muscle Building Nutrition In Mitigating The Self Reports Of Mild To Moderate Depression. Three Mildly-Moderately Depressed Male College Students Were Personally Trained In High Intensity Weight Training, Given Dietary Consultation, And Assessed Weekly For One Month. Analysis Indicated That The High Intensity Weight Training And Dietary Consultation Was Effective In Significantly Reducing Self-Reported Depression In The Treatment Subjects. More Specifically, All Three Subjects Showed A Dramatic Increase In Strength Levels (80+ Pounds) As Measured By The Barbell Bench Press. With These Strength Gains Came An Appreciable Improvement In Lean Muscle Mass For All Three Subjects. This Additional Lean Muscle Mass May Have Been Responsible For An Improvement In Subjects' Perceptions Of Their Own Body, And May Account For The Augmented Body-Esteem Scores For All Three Subjects. Because Body Esteem Is Such An Integral Component Of Self-Esteem, An Improvement In Body Esteem May Have A Causative Effect In Improving Self-Esteem, As Exhibited By All Three Subjects, On The

Coopersmith Self-Esteem Inventory. Additionally, Increases In Self-Esteem Were Viewed As A Contributing Factor In The Reduction Of Self-Reports Of Depression For All Three Subjects, As Measured By The Depression Adjective Check Lists, Beck Depression Inventory, And Automatic Thoughts Questionnaire. Additionally, Four Weekly Follow-Ups Indicated That Weight Training And Muscle Building Diet May Prove To Provide A Tenable Treatment For Depression. These Results Are In Accord With More Recent Findings Showing The Psychological Benefits Of Regular Strength Training.

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Dissertation Abstracts Online
01289106 ***ORDER NO***: AAD13-50463
TITLE: A Comparison Of Progressive-Resistance Weight Training And Speed-Strength Weight Training On Strength, Speed And Power
AUTHOR: Mears, G. Derrick
DEGREE: M.S.
YEAR: 1992
CORPORATE SOURCE/INSTITUTION: Central Missouri State University (0958)
CHAIR: James Pilkington
SOURCE: VOLUME 31/02 Of MASTERS ABSTRACTS. PAGE 540. 67 PAGES
DESCRIPTORS: Education, Physical
Several studies have Been Conducted Using Weight Training To Develop Attributes Necessary For Successful Sport Participation. This Study Examined The Effects Of Two Types Of Weight Training Programs On The Development Of Speed, Strength And Power. Twenty-Two Male College Students At Central Missouri State University Participated In The Study And Performed Either A Progressive-Resistance Weight Training Program Or Speed-Strength Weight Training Program. The Subjects Trained For Four Weeks And Were Pre-Tested And Post-Tested Using The Squat, 30 Yard Sprint And Vertical Jump. No Significant Difference Was Found To Exist Between The Groups In Developing Speed, Strength Or Power.

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Dissertation Abstracts Online
01259394 ***ORDER NO***: AAD93-02160
TITLE: Cardiorespiratory Endurance, Muscle Endurance And Flexibility: A Comparison Study Of Taekwon-Do And Aerobic Exercise In Adult Males (Men)
AUTHOR: Young, Doris Ivar Allen
DEGREE: ED.D.
YEAR: 1992
CORPORATE SOURCE/INSTITUTION: Temple University (0225)
MAJOR ADVISER: M. R. Levy
SOURCE: Volume 53/09-A Of Dissertation Abstracts International. Page 3143. 121 Pages
DESCRIPTORS: Education, Physical; Health Sciences, Recreation; Education, Health
The purpose of this Investigation Was To Compare The Effects Of Aerobic Exercise And Taekwon-Do Upon Cardiorespiratory Endurance, Muscle Endurance And Trunk And Leg Flexibility. A Convenience Sample Of Two Groups Of Males Between The Ages Of 18 And 35 (N = 70) Were Measured For These Attributes. Thirty-Five Men Were Evaluated Before And After Participation In An Eight-Week Aerobic Fitness Program. Thirty-Five

Other Men Were Evaluated Before And After Participation In Eight Weeks Of Taekwon-Do Karate. Both Groups Achieved Gains In Cardiorespiratory Endurance, Muscle Endurance, And Flexibility. A Pooled T-Test Indicated That There Was A Statistically Significant (P $>$.05) Improvement In The Hip And Trunk Flexibility Of Men Taking Taekwon-Do Karate. However, Pooled T-Tests Showed That There Was No Statistically Significant Difference Between The Groups For Cardiorespiratory Endurance Or Muscle Endurance (P $<$.05). An Analysis Of Covariance Was Performed So As To Factor Out The Flexibility Differences In The Groups When They Started Their Respective Programs. The Analysis Of Covariance Showed That There Was Not A Statistically Significant Difference Between The Two Groups At The (P $>$.05) Level For Any Of The Dependent Variables. It Did, However, Approach A Significant Statistical Difference In Flexibility (P $<$.10). Further Investigation Demonstrated That If Men Started The Taekwon-Do Program With Very Poor Trunk And Hip Flexibility (Able To Sit And Reach Only $-$2 Inches Or Less) They Showed A Statistically Significant Increase In Flexibility (P $>$.05). This Did Not Occur In The Community Y Flex Program.

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Dissertation Abstracts Online

01194812 ***ORDER NO***: AAD91-34295

TITLE: The Effect Of Low Intensity Aerobic Exercise On Muscle Strength, Flexibility, And Balance Among Sedentary Elderly Persons

AUTHOR: Mills, Eugenia Mae

DEGREE: PH.D.

YEAR: 1991

CORPORATE SOURCE/INSTITUTION: Case Western Reserve University (Health Sciences) (0499)

ADVISER: Beverly L. Roberts

SOURCE: Volume 52/07-B Of Dissertation Abstracts International. Page 3530. 137 Pages

DESCRIPTORS: Health Sciences, Nursing

The purpose of this Study Was To Determine The Effects Of A Low Intensity Aerobic Exercise Program On Muscle Strength And Flexibility Of The Lower Extremities And Balance Among Sedentary Elderly Persons. Proprioception, Vibratory Sensation, And Visual Acuity Were Assessed And Statistically Controlled For When They Were Significantly Related To The Dependent Variables. Using Birren And Renner's (1977) Use/Disuse Theory, The Low Aerobic Exercise Program Was Expected To Increase Balance And Perception Of Balance And Increase Flexibility And Muscle Strength Of The Knees And Ankles. This Pretest-Posttest Quasi-Experimental Study Consisted Of 47 Sedentary Subjects Not Engaged In Regular Exercise And Living In Metropolitan Housing In Southwestern Ohio. Convenience Sampling Was Used With Two Apartment Complexes Randomly Assigned To The Experimental Or Comparison Groups. To Prevent Diffusion Of Treatment, Subjects Were Assigned To These Groups Depending On Their Place Of Residence. The 20 Experimental Subjects, With A Mean Age Of 75.3, Participated In Eight Weeks Of Low Intensity Exercise While The Comparison Group (N = 20), With A Mean Age Of 74.8, Maintained Their Usual Level Of Activity For Eight Weeks. The Low Intensity Aerobic Exercise Program Was Three Times A Week For Eight Weeks. Experimental Subjects Also Did The Exercises On Their Own Between Classes. The Program Consisted Of Stretching And Strengthening Exercises For The Lower Extremities, And, Except For Two Exercises, They

Were Done While Sitting In A Chair. The Exercise Group Had Significantly Greater Flexibility Of The Ankles And The Right Knee Than The Comparison Group. No Significant Differences Were Found Between The Groups For Muscle Strength. Although Balance And Perception Of Balance Were Not Significantly Different Between The Groups, The Experimental Group Improved Their Balance By 22.4% From Pretest. This Study Demonstrated That Sedentary Elders Can Safely Perform These Exercises, Find Them Easy To Do, And Are Able To Fit Them Into Their Daily Routine. Replication Of This Study Should Be Done With Different Populations Of Sedentary Elders And With Longer Duration For The Exercise Program. These May Increase The Effect Of The Program.

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Dissertation Abstracts Online
1078893 ***ORDER NO***: AAD89-25308
TITLE: Exercise Maintenance Behavior Of Subjects With Arthritis Following Participation In A Supervised Exercise Program
AUTHOR: Minor, Marian A.
DEGREE: PH.D.
YEAR: 1989
CORPORATE SOURCE/INSTITUTION: University Of Missouri - Columbia (0133)
SUPERVISOR: James D. Brown
SOURCE: Volume 50/07-A Of Dissertation Abstracts International. Page 1955. 214 Pages
DESCRIPTORS: Education, Health
The purpose of this Research Was To Identify Factors Associated With A Supervised Exercise Experience That Best Explained Maintenance Of Exercise Behavior Over Time. The Method Used Was An Integral Secondary Analysis Of New And Existing Data Collected In A Randomized, Clinical Trial Of The Efficacy Of Aerobic Exercise For Subjects With Rheumatoid Arthritis And Osteoarthritis. The Intervention Was 12 Weeks Of Either Walking Or Aquatic Exercise Performed At Individually Prescribed Exercise Heart Rate. Variables Of Interest Included Aerobic Capacity, Exercise Test Duration, Flexibility, Disease Measures, Self Reported Health Status, Social Support For Exercise, Impact Of Illness On Exercise And Post-Intervention Exercise Behaviors. Using The All Possible Regressions Search Procedure, Regression Functions Were Selected To Explain Exercise Behavior At Three, Nine And 18 Or More Months After The Exercise Intervention. At Three Months, Aerobic Capacity, Depression, Anxiety And Social Activity Comprised The Selected Regression Function With An R$\Sp2$ Of 0.45. At Nine Months, Physical Activity, Anxiety, Depression, Friend Support For Exercise And Previous Exercise Behavior Were Included In The Selected Function With An R$\Sp2$ Of 0.35. At Eighteen Or More Months After The Exercise Class, Aerobic Capacity, Pain, And Previous Exercise Behavior Produced The Function With An R$\Sp2$ Of 0.42 (P = 0.0001 For All Functions). The Best Explanatory Variables Were Baseline Measures (4), Change Scores (4), Social Support (1), And Prior Exercise Behavior (2). Change Scores Added Significantly To All Explanatory Models. The Further In Time From The Exercise Class Experience, The Less Important Baseline Measures Became In Explaining Current Exercise Behavior.

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Dissertation Abstracts Online
0980037 ***ORDER NO***: AAD13-31556
TITLE: A Comparison Of Isotonic And Hydraulic Resistance Training On Strength, Speed, And Power
AUTHOR: Mccormick, Thomas Paul
DEGREE: M.A.
YEAR: 1987
CORPORATE SOURCE/INSTITUTION: Northeast Missouri State University (6180)
SOURCE: VOLUME 26/02 Of MASTERS ABSTRACTS. PAGE 0180. 59 PAGES
DESCRIPTORS: Education, Physical
The purpose of this Study Was To Compare The Effects Of Isotonic And Hydraulic Resistance Training On Strength, Speed, And Power. Twenty-Six Male Students Attending Northeast Missouri State University During The Spring Semester Of 1982 Were Used As Subjects. They Were Randomly Assigned To One Of Two Experimental Groups That Trained Exclusively Using Either Isotonic Or Hydraulic Resistance Training. The Two Experimental Groups Trained Three Times Weekly For 10 Weeks. All Strength, Power, And Speed Tests Were Administered Before And After 10 Weeks Of Training. An Independent T-Test Revealed Significant Improvements (P $<$.05) In Strength, Speed, And Power For Both Groups. An Analysis Of Covariance Was Used To Determine If Significant Difference Existed Between The Two Training Groups. Isotonic Training Produced Superior Gains (P $<$.05) Over Hydraulic Resistance Training On The Free Weight Bench Press. No Significant Difference Existed Between The Groups In Other Strength, Speed, And Power Tests.

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Dissertation Abstracts Online
0974449 ***ORDER NO***: AAD87-28835
TITLE: A Comparison Of The Effects Of Three Strength Training Programs On The Development Of Rotational Trunk Strength
AUTHOR: Obermeyer, Dennis Herman
DEGREE: ED.D
YEAR: 1987
CORPORATE SOURCE/INSTITUTION: University Of Missouri - Columbia (0133)
SOURCE: Volume 48/10-A Of Dissertation Abstracts International. Page 2571. 159 Pages
DESCRIPTORS: Education, Physical
CURRENT RESEARCH SUPPORTS THE SPECIFICITY OF TRAINING CONCEPT: A Muscle Trained In A Specific Movement Will Increase Its Ability To Create Effective Force In That Movement. Thus Rotatory Trunk Muscle Training Exercises Utilizing Resistance To Rotation Should Increase The Torque Though Which Rotatory Trunk Movement Is Made. Current Training Methods Emphasize Trunk Flexion And Extension (Sit-Ups And Back Extensions), Which Involves Many Of The Same Muscles Used In Trunk Rotation, However, These Exercises Have Not Been Documented For Producing Rotatory Trunk Strength Gains. The Purpose Of This Study Was To Determine The Effects Of Three Strength Training Programs On The Development Of Rotational Trunk Strength. Fifty-Nine Volunteers From Weight Training Classes At The University Of Missouri-Columbia Were Randomly Assigned To Three Treatment Groups. Each Subject Underwent Pretest And Posttest Rotational Trunk Strength Evaluations On The Isostation B-100

Machine. All Subjects In The Three Groups Participated In A 17-Exercise General Strength Training Program, Which Excluded Utilizing Trunk Muscles In Concentric Or Eccentric Contractions. In Addition, Experimental Group I Subjects Trained On The O-TRIM (Obermeyer Trunk Rotation Isotonic Machine), Which Provides Resistance To Trunk Rotation Exercises, While Experimental Group II Subjects Performed Sit-Ups And Back Extensions. The Control Group Subjects Abstained From Any Additional Exercises. The One-Way Analysis Of Covariance Statistical Procedure Was Employed To Analyze Results, With Gain Scores As The Dependent Variable And The Pretest Scores As The Covariate. Statistical Hypotheses Were Tested By Performing T-Statistic Mean Comparisons On The Adjusted Means. Within Group Comparisons Demonstrated Statistically Significant Strength Gains In All Three Groups. However, Experimental Group I Achieved Statistically Significantly Greater Strength Gains When Comparisons Were Made Among Groups. Conclusions. (1) The Most Effective Way To Develop Rotational Trunk Strength Is To Train The Trunk Muscles Using Resistance To Trunk Rotation. (2) Although A General Strength Training Program That Does Not Include Trunk Exercises, Or Includes Non-Specific Trunk Exercises Will Result In Rotational Trunk Strength Gains, Such Programs Are Less Effective Than One Which Emphasizes Specific Rotational Trunk Exercises. (3) The O-TRIM Offers An Effective Modality For The Development Of Rotational Trunk Strength.

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Dissertation Abstracts Online
534763 ***ORDER NO***: AAD75-19836
TITLE: A Comparison Of The Effects Of Isotonic, Isokinetic And Negative Resistance Strength Training Programs.
AUTHOR: Shepard, Ralph Gregory
DEGREE: ED.D.
YEAR: 1975
CORPORATE SOURCE/INSTITUTION: Brigham Young University (0022)
SOURCE: Volume 36/03-A Of Dissertation Abstracts International. Page 1376. 76 Pages
DESCRIPTORS: Education, Physical

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Dissertation Abstracts Online
481888 ***ORDER NO***: AAD73-31203
TITLE: A Comparison Of The Effects Of Conventional, High Repetition, And Modified High Repetition Weight Training Programs On Strength And Cardiovascular Endurance.
AUTHOR: Sorenson, Marcus Bruce
DEGREE: ED.D.
YEAR: 1973
CORPORATE SOURCE/INSTITUTION: Brigham Young University (0022)
SOURCE: Volume 34/07-A Of Dissertation Abstracts International. Page 3970. 70 Pages
DESCRIPTORS: Education, Physical

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ENTER:ss
 SET  REC.  OCC. DESCRIPTION OF SET      SET  REC.  OCC. DESCRIPTION OF SET
  1  2071   2071 ST/FLEXIBILITY          23    86     86 20-(21+22)
  2   408    408 ST/MUSCULAR STRENGTH     24  1284   1284 13-(21+22)
  3     2      2 1*2                     25     1      1 24*1
  4  7768   7768 ST/HUMAN PERFORMANCE     26  1399   1399 ST/COGNITION
  5     2      2 1*3                     27     2      2 1*26
  6     3      3 1*4                     28     1      1 1*13
  7    49     49 2*4                      29  1472   1472 ST/WORK CAPACITY
  8   957    957 ST/PHYSICAL FITNESS      30     2      2 1*29
  9  3364   3364 ST/PHYSICAL EXERCISE     31  2455   2455 ST/OPERATOR PERFORMAN
 10     1      1 1*(8+9)                 32    17     17 2*31
 11  4208   4208 ST/COMPARISON           33     5      5 UTP/CIRCUIT *2 TRAINI
 12    11     11 11*(8+9+2)              34  1641   1641 ST/TASKS
 13  1312   1312 RT/EXERCISE PHYSIOLOG    35    12     12 34*8
 14   759    759 RT/FLIGHT FITNESS        36     4      4 UTP/WEIGHT *3 LIFTING
 15    15     15 RT/SPORTS MEDICINE       37  7247   7247 ST/PHYSIOLOGICAL EFFE
 16    60     60 13*2                   38    55     55 37*(1+2)
 17    56     56 )16//N,A                 39    27     27 38-99
 18   132    132 (8+9)*2                  40    22     22 )39//N,A
 19    99     99 18-99                  41  1204   1204 ST/HEALTH
 20    94     94 )19//N,A                 42     3      3 41*(1+2)
 21  8036   8036 ST/MICROGRAVITY         43    67     67 (8+9)*41
 22  2314   2314 ST/SPACE PROGRAMS       44    66     66 43-99
MORE  ENTER:p
 SET  REC.  OCC. DESCRIPTION OF SET      SET  REC.  OCC. DESCRIPTION OF SET
 45    51     51 )44//N,A                 67     2      2 TX/WELLNESS
 46  3227   3227 ST/PHYSIOLOGICAL TEST    68   561    809 TX/AEROBIC
 47    43     43 (1+2)*46                 69     3      7 TX/AEROBICS
 48    22     22 47-99                  70   209    221 ATL/AEROBIC //AEROBIC
 49    22     22 )48//N,A                 71    24     51 (68+69+70)*(1+2)
 50  9456   9456 BT/MEASURING INSTRUME    72     3      4 71-99
 51   449    449 ST/DYNAMOMETERS          73  3895   3895 ST/CARDIOVASCULAR SYS
 52   534    534 RT/ERGOMETERS            74     7      7 73*(1+2)*(8+9)
 53   378    378 (50+51+52)*(8+9)         75   240    240 )99//N,A
 54   363    363 53-99
 55   670    670 ST/GLUCOSE
 56   512    512 ST/CARBOHYDRATE METAB
 57   459    459 ST/FATTY ACIDS
 58   348    348 54-(55+56+57)
 59    28     30 ATL/ERGOMETRY
 60   534    534 ST/ERGOMETERS
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61 17 17 60*(1+2)
62 6 6 (8+9)*4*41
63 835 835 ST/INJURIES
64 6 6 63*(1+2)
65 29 29 (8+9)*63
66 25 25 65-99

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95A83381 ISSUE 9 CATEGORY 51 ***RPT#***: HTN-95-21596 ISSN 8750-7587 95/01/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of strength and endurance training on thigh and leg muscle mass and composition in elderly women

AUTHORS: A/Sipila, Sarianna; B/Suominen, Harri ***PAA***: A/University of Jyvaskyla, Jyvaskyla, Finland; B/University of Jyvaskyla, Jyvaskyla, Finland

CIO: Finland-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 1, January 1995, P. 334-340 Research Sponsored By The Ministry Of Education, Finland.

MAJS: /*Aging (Biology)/*Body Composition (Biology)/*Fibers/*Leg (Anatomy)/*Muscles/*Muscular Fatigue/*Muscular Strength/*Physical Exercise/*Physical Fitness/*Weight (Mass)

MINS: / Computer Aided Tomography/ Exercise Physiology/ Fats/ Females/ Human Beings/ Human Body/ Loads (Forces)

ABA: Author (Herner)

ABSTRACT: The effects of 18 wk of intensive strength and endurance training on knee extensor, knee flexor, and lower leg muscle mass and composition were studied in 76- to 78-yr-old women. Muscle cross-sectional area(CSA), lean tissue CSA, and relative proportion of fat were determined using computed tomography. The strength-trained women increased their total muscle lean tissue CSA of the thigh, quadriceps CSA, quadriceps lean tissue CSA and mean Hounsfield unit of the lower leg muscles compared with the changes that occured in the control group during the experiment. The change in quadriceps lean tissue CSA because of the strength training was also significant compared with that in the endurance group. The relative proportion of fat within the quadriceps muscle decreased due to the strength training compared with the changes that occured in the endurance group. The results show that intensive strength training can induce skeletal muscle hypertrophy in elderly women and thereby also reduce the relative amount of intramuscular fat, whereas the effects of endurance training are negligible.

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95A82017 ISSUE 8 CATEGORY 51 ***RPT#***: HTN-95-91915 ISSN 8750-7587 95/02/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Changes in human skeletal muscle ultrastructure and force production after acute resistance exercise

AUTHORS: A/Gibala, M. J.; B/Macdougall, J. D.; C/Tarnopolsky, M. A.; D/Stauber, W. T.; E/Elorriaga, A. ***PAA***: A/McMaster University, Hamilton, Ontario, Canada; B/McMaster University, Hamilton, Ontario, Canada; C/McMaster University, Hamilton, Ontario, Canada; D/McMaster University, Hamilton, Ontario, Canada; E/McMaster University, Hamilton, Ontario, Canada

CIO: Canada-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 2, February 1995, P. 702-708 Research Sponsored By The NSERC.

MAJS: /*Injuries/*Loads (Forces)/*Muscular Fatigue/*Muscular Function/*Muscular Strength/*Musculoskeletal System/*Physical Exercise

MINS: / Arm (Anatomy)/ Cells (Biology)/ Electron Microscopy/ Human Beings/ Human Body/ Males

ABA: Author (Herner)

ABSTRACT: Muscle ultrastructure and contractile properties were examined before and after a single bout of resistance exercise (8 sets of 8 repetitions at 80% of 1 repetition maximum). Eight untrained males performed the concentric (Con) phase of arm-curl exercise with one arm and the ecentric (Ecc) phase with the other arm. Needle biopsies were obtained from biceps brachii before exercise (Base), immediately postexercise from each arm (post-Con and post-Ecc), and 48 h postexercise from each arm (48 h-Con and 48 h-Ecc). Electron microscopy was used to quantify the presence of disrupted fibers in each sample. Analysis of variance revealed a greater proportion of disrupted fibers in post-Con, post-Ecc, 48 h-Con, and 48 h-Ecc samples compared with Base. Significantly more fibers were disrupted in post-Ecc (82%) and 48 h-Ecc (80%) samples compared with post-Con (33%) and 48 h-Con (37%), respectively. Voluntary and evoked strength measurements recovered to Base values within 24 h in the Con arm but remained depressed for 72-96 in the Ecc arm. These data indicate that both the raising and lowering phases of weightlifting produce myofibrillar disruption, with the greatest disruption occurring during the lowering phase.

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95A81948 ISSUE 8 CATEGORY 51 ***RPT#***: HTN-95-00431 ISSN 8750-7587 95/03/00 14 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Compatibility of high-intensity strength and endurance training on hormonal and skeletal muscle adaptations

AUTHORS: A/Kraemer, William J.; B/Patton, John F.; C/Gordon, Scott E.; D/Harman, Everett A.; E/Deschenes, Michael R.; F/Reynolds, Katy; G/Newton, Robert U.; H/Triplett, N. Travis; I/Dziados, Joseph E.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 3, March 1995, P. 976-989 Research Supported By The Pennsylvania State University.

MAJS: /*Corticosteroids/*Fibers/*Hormone Metabolisms/*Intensity/*Muscles/* Muscular Strength/*Physical Exercise/*Physical Fitness

MINS: / Exercise Physiology/ Human Beings/ Human Body/ Males/ Musculoskeletal System/ Treadmills

ABA: Author (Herner)

ABSTRACT: Thirty-five healthy men were matched and randomly assigned to one of four training groups that performed high-intensity strength and endurance training (C; n = 9), upper body only high- intensity strength and endurance training (UC; n = 9), high-intensity endurance training (E; n = 8), or high-intensity strength training (ST; n = 9). The C and ST groups significantly increased one-repetition maximum strength for all exercises. Only the C, UC, and E groups demonstrated significant increases in treadmill maximal oxygen consumption. The ST group showed significant increases in power output. Hormonal responses to treadmill exercise demonstrated a differential response to the different training programs, indicating that the underlying physiological milieu differed with the training program. Significant changes in muscle fiber areas were as follows: types I, IIa, and IIc

increased in the ST group; types I and IIc decreased in the E group; type IIa increased in the C group; and there were no changes in the UC group. Significant shifts in percentage from type IIb to type IIa were observed in all training groups, with the greatest shift in the groups in which resistance trained the thigh musculature. This investigation indicates that the combination of strength and endurance training results in an attenuation of the performance improvements and physiological adaptations typical of single-mode training.

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95A81946 ISSUE 8 CATEGORY 51 ***RPT#***: HTN-95-00429 ISSN 8750-7587 95/03/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Performance and excitability of mdx mouse muscle at 2, 5, and 13 wk of age

AUTHORS: A/Rezvani, Mojgan; B/Cafarelli, Enzo; C/Hood, David A. ***PAA***: A/York University, North York, Ontario, Canada; B/York University, North York, Ontario, Canada; C/York University, North York, Ontario, Canada

CIO: Canada-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 3, March 1995, P. 961-967 Research Supported By The NSERC Of Canada.

MAJS: /*Contraction/*Growth/*Muscles/*Muscular Strength/*Myoelectric Potentials

MINS: / Exercise Physiology/ Mice/ Mitochondria/ Proteins

ABA: Author (Herner)

ABSTRACT: Dystrophin is a 427-kDa protein localized adjacent to the sarcolemma in skeletal muscle. Its physiological role remains uncertain, although its absence is known to cause muscular dystrophy. In this study, the function of dystrophin was investigated using the dystrophin-deficient mdx mouse. Control and mdx animals at 2, 5, and 13 wk of age (n = 8-11/age) were compared to evaluate in situ gastrocrenius-plantaris-soleus muscle contractile, endurance, and excitability properties at nondegenerated, degenerated, and regenerated stages, respectively. Twitch and tetanic tensions expressed per gram of muscle mass were lower in mdx muscle only at 5 wk. Fatigue produced during successive contractions at 2, 10, 20 Hz did not differ between the two groups at 2 and 5 wk but was lower in mdx muscle at 13 wk. This was not attributed to differences in mitochondria, since cytochrome-c oxidase activity was similar in mdx and control muscle. Contractile properties of control and mdx muscle became faster with age, and at 13 wk the time to peak twitch tension was shorter in mdx muscle relative to control, whereas the half-relaxation times did not differ. Mass action potential area (M wave), an index of muscle excitability, was not significantly different between mdx and control muscle at 2 or 5 wk but was greater in mdx at 13 wk. Thus, in this weight bearing muscle group, the lack of dystrophin has only a moderate impact in modifying muscle function relative to contractile properties, fatigability, or excitability. The differences noted between the mdx and control muscle are age specific and are likely related to the extent of degeneration and regeneration processes that occur secondary to the absence of dystrophin in mdx muscle.

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95A81940 ISSUE 8 CATEGORY 51 ***RPT#***: HTN-95-00423 ISSN 8750-7587 CNT#: NIH-GM-08400 NIH-HL-07249 NIH-NS-20544 NIH-NS-07309 NIH-RR-05675 95/03/00 13 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Reduced motor unit activation of muscle spindles and tendon organs in the immobilized cat hindlimb

AUTHORS: A/Nordstrom, Michael A.; B/Enoka, Roger M.; C/Reinking, Robert M.; D/Callister, Robert C.; E/Stuart, Douglas G. ***PAA***: A/University of Arizona, Tucson, AZ, US; B/University of Arizona, Tucson, AZ, US; C/University of Arizona, Tucson, AZ, US; D/University of Arizona, Tucson, AZ, US; E/University of Arizona, Tucson, AZ, US

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 3, March 1995, P. 901-913

MAJS: /*Activation (Biology)/*Atrophy/*Fibers/*Immobilization/*Muscular Strength /*Spindles/*Tendons

MINS: / Cats/ Deconditioning/ Exercise Physiology/ Leg (Anatomy)/ Muscular Function

ABA: Author (Herner)

ABSTRACT: Six weeks of limb immobilization of a healthy muscle (cat tibialis posterior) at a short length resulted in a significant reduction of mean fiber area for all fiber types (I, 71% of control; IIa, 77% of control; IIb, 79% of control), whereas fiber type proportions were unchanged. For motor units, there was a reduction in peak tetanic force (type slow greater than fast fatigue greater than fast fatigable); an increase in the twitch-to-tetanus for fast fatigue-resistant and slow units; and no effect on the twitch force, twitch time course, or fatigability. The reduction in peak was greater than expected because of fiber atrophy in slow units. Immobilization had a minimal effect on muscle afferent (Ia and spindle group II) responses to a ramp-and-hold stretch of the passive muscle. Tendon organ (Ib) afferents had an increased responsiveness to stretch after immobilization but only when the muscle was streched from a short resting length. However, immobilization reduced the modulation of muscle afferent discharge in response to tetanic contractions of single motor units. The decline in responsiveness of spindles was a result of the reduced tetanic force of motor units. In contrast, tendon organs in immobilized muscle were twice as likely to convey no information on the contraction of a single motor unit and were more likely to be unloaded, suggesting that immobilization caused the functional denervation of some muscle fibers. Thus the response of muscle spindles and tendon organs in immobilized muscle reflected atrophic changes in extrafusal fibers but did not provide evidence for substantial disturbance of receptor function.

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95A81933 ISSUE 8 CATEGORY 51 ***RPT#***: HTN-95-00416 ISSN 8750-7587 CNT#: NIH-NS-08634 NIH-NS-07309 NIH-NS-20544 95/03/00 9 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Short-term immobilization has a minimal effect on the stength and fatigability of a human hand muscle

AUTHORS: A/Fuglevand, Andrew J.; B/Bilodeau, Martin; C/Enoka, Roger M.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 78, No. 3, March 1995, P. 847-855

MAJS: /*Electromyography/*Hand (Anatomy)/*Immobilization/*Muscular Fatigue/* Muscular Strength/*Neuromuscular Transmission/*Physical Work

MINS: / Exercise Physiology/ Human Beings/ Human Body/ Muscles

ABA: Author (Herner)

ABSTRACT: The purpose of this study was to determine the association between reduced fatigability typically observed in disused muscle and an improved resistance to the impairment of neuromuscular propagation. Endurance time of an isometric contraction sustained at 35% of maximum voluntary contraction (MVC) force and the fatigue-induced

charge in the evoked compound muscle action potential (M wave) were measured in the first dorsal interosseus muscle of human subjects before, during, and after 3 (n = 9) or 5 wk (n = 2) of immobilization. The immobilization procedure caused a substantial decline in the chronic electromyographic (EMG) activity (to 4% of control value) of the first dorsal interosseus muscle. Endurance time was found to be significantly correlated to the maintenance of M-wave amplitude during the fatigue task. However, neither of these variables was significantly affected by immobilization. Also, immobilization had no significant effect on the prefatigue values of MVC force and EMG or twitch contraction time or on the postfatigue changes in MVC force and EMG, M wave duration, twitch amplitude, and contraction time. In the unfatigued muscle, immobilization did cause an increase in twitch force (153%) and a decrease in M-wave amplitude (67%). It appears, therefore, that a healthy first dorsal interosseus muscle is generally resistant to adaptation when its use has been reduced for 3-5 wk by immobilization.

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95A74302 ISSUE 7 CATEGORY 51 ***RPT#***: HTN-95-A0601 ISSN 8750-7587 94/07/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Adductor pollicis muscle fatigue during acute and chronic altitude exposure and return to sea level

AUTHORS: A/Fulco, Charles S.; B/Cymerman, Allen; C/Muza, Stephen R.; D/Rock, Paul B.; E/Pandolf, Kent B.; F/Lewis, Steven F.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 1, July 1994, P. 179-183

MAJS: /*Altitude Acclimatization/*Contraction/*High Altitude Environments/* Hypoxia/*Muscular Fatigue/*Muscular Strength

MINS: / Exercise Physiology/ Human Beings/ Human Body/ Males/ Pulmonary Functions/ Stress (Physiology)

ABA: Author (Herner)

ABSTRACT: Large muscle exercise performance is impaired during acute exposure to normobaric or hypobaric hypoxia, but the effects of hypoxic conditions on fatigue of isolated smaller muscle groups per se are poorly defined. We studied how acute and chronic altitude (ALT) exposure and post-ALT return to sea level (SL) affects voluntary strength and fatigue of the adductor pollicis muscle. Eight healthy men (mean age 28 yr) were studied on five separate occasions: at SL, on days 1 (acute) and 13 (chronic) at ALT (4,300 m), and on days 1 (post 1) and 3 or 4 (post 2) at SL after 20 days of residence at ALT. On each day, maximal voluntary contractions (MVCs) of the adductor pollicis were obtained before and at the end of each minute of submaximal intermittent contractions of the adductor pollicis (50% of MVC of rested muscle, 5 s of contraction/5 s of rest) until exhaustion, defined as the inability to exert or maintain 50% of rested MVC. MVC of rested muscle did not differ among days. Time to exhaustion was shorter at acute ALT than at SL and tended to be shorter than at chronic ALT. Compared with acute and chronic ALT, time to exhaustion was prolonged during post 1 but not post 2. We conclude that (1) MVC of rested adductor pollicis muscle is not impaired during or after ALT exposure, (2) compared with SL conditions, acute but not chronic ALT exposure leads to a more rapid decline in adductor pollicis MVC associated with submaximal contractions, and (3) time to exhaustion is prolonged for equal to or more than 1 day after return from ALT.

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95A71482 ISSUE 6 CATEGORY 51 ***RPT#***: HTN-95-70460 ISSN 8750-7587 CNT#: NIH-DE-07687 NIH-AG-00114 94/12/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Recovery of medial gastrocnemius muscle grafts in rats: Implications for the plantar flexor group

AUTHORS: A/Miller, Stephanie W.; B/Hassett, Cheryl A.; C/White, Timothy P.; D/Faulkner, John A.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 6, December 1994, P. 2773-2777

MAJS: /*Contraction/*Grafting/*Growth/*Muscles/*Muscular Function

MINS: / Density (Mass/Volume)/ Exercise Physiology/ Force/ Leg (Anatomy)/ Muscular Strength/ Rats/ Transplantation

ABA: Author (Herner)

ABSTRACT: Medical gastrocnemius (MGN) muscles were grafted in 18 rats and evaluated at 60, 90, and 120 days after the operation. Our purpose was to investigate the degree of recovery of the vascularized MGN grafts and the entire plantar flexor muscle group. Compared with control values, muscle mass and maximum force of MGN grafts were decreased by 33 and 38% at 60 days, 22 and 32% at 90 days, and 13 and 15% at 120 days. At 60 and 90 days, the deficits in maximum force for the entire plantar flexor muscle group, including the graft, were 29 and 17%, respectively. No difference was observed at 120 days. At 60 days, the deficit in the total mass of the plantar flexor group was 14% compared with control values, but by 90 days no deficit was observed. The restoration of normal plantar flexor group structure and function indicates that the degree of recovery attained by MGN grafts, although not complete, was sufficient to ensure that the performance of the total muscle group was not compromised.

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95A71479 ISSUE 6 CATEGORY 51 ***RPT#***: HTN-95-70457 ISSN 8750-7587 CNT#: NIH-AG-09000 94/12/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Training-related enhancement in the control of motor output in elderly humans

AUTHORS: A/Keen, Douglas A.; B/Yue, Guang H.; C/Enoka, Roger M. ***PAA***: A/Univ. of Arizona, Tucson, AZ, US; B/Univ. of Arizona, Tucson, AZ, US; C/Univ. of Arizona, Tucson, AZ, US

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 6, December 1994, P. 2648-2658

MAJS: /*Loads (Forces)/*Muscular Function/*Muscular Strength/*Neuromuscular Transmission/*Physical Fitness

MINS: / Age Factor/ Aging (Biology)/ Electromyography/ Exercise Physiology/ Gerontology/ Human Beings/ Human Body

ABA: Author (Herner)

ABSTRACT: The increase in motor unit force that occurs with aging has been hypothesized to cause a decline in the ability to maintain a constant submaximal force. To test this hypothesis, young and elderly subjects performed a 12-wk strength-training program that was intended to increase motor unit force. The training program caused similar increases (% initial) in the training load, twitch force, and maximum voluntary contraction force of the first dorsal interosseus muscle for the young and elderly subjects. The increase in strength was associated with a modest increase in muscle volume (7% of initial value) and a

nonmonotonic increase in the surface-recorded electromyogram that was significant at week 8 but not at week 12. The elderly subjects reduced the variability in force at the lower target forces (2.5, 5.0, and 20.0% maximum voluntary contraction force). This improvement, however, was unrelated to changes in the distribution of motor unit forces, which was not consistent with the hypothesis that the greater coefficient of variation for the force fluctuations is due to increased motor unit forces.

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95A68935 ISSUE 5 CATEGORY 51 ***RPT#***: HTN-95-A0152 ISSN 8750-7587 94/08/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Index finger position and force of the human first dorsal interosseus and its ulnar nerve antagonist

AUTHORS: A/Zijdewind, I.; B/Kernell, D. ***PAA***: A/Amsterdam Univ., Academisch Medisch Centrum, Amsterdam, Netherlands; B/Groningen Univ., Groningen, Netherlands

CIO: Netherlands-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 2, August 1994, P. 987-997 Research Sponsored By Nederlands Organization For Scientific Research.

MAJS: /*Electric Stimuli/*Fingers/*Muscular Fatigue/*Muscular Strength/* Musculoskeletal System

MINS: / Contraction/ Electrophysiology/ Exercise Physiology/ Human Beings/ Human Body

ABA: Author (Herner)

ABSTRACT: In normal subjects, maximum voluntary contraction (MVC) and electrical ulnar nerve stimulation (UNS; 30-Hz bursts of 0.33 s) were systematically compared with regard to the forces generated in different directions (abduction/adduction and flexion) and at different degrees of index finger abduction. With a resting' hand position in which there was no index finger abduction, UNS produced about one-half of the abduction force elicited by an MVC (mean ratio 51%). Qualitatively, such a discrepancy would be expected, because UNS activates two index finger muscles with opposing actions in the abduction/adduction plane of torques: the first dorsal interosseus (FDI) and the first palmar interosseus (FPI). The abduction forces produced by MVC and UNS were very sensitive to index finger abduction angle: at a maximum degree of abduction, the UNS-generated force even reversed its direction of action to adduction (with FPI dominating) and the abduction MVC declined to 37% of that in the resting hand position. Inasmuch as these declines in MVC and UNS-generated abduction force could not be explained by a change in moment arm, the main alternative seemed to be abduction-associated alterations in FDI fiber length (analysis by previously published biomechanical data). The FDI and FPI were further compared by application of a UNS-generated fatigue test (5-min burst stimulation), with the index finger kept at a neutral' angle, i.e., the abduction angle at which, in the unfatigued state, the forces of the FDI and FPI were in balance (zero net UNS-generated abduction/adduction force). There was no major difference in the fatigability of the two muscles, yet the fatigue reactions of the two muscles were not fully identical.

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95A68930 ISSUE 5 CATEGORY 51 ***RPT#***: HTN-95-A0147 ISSN 8750-7587 94/08/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Catecholamine responses to short-term high-intensity resistance exercise overtraining

AUTHORS: A/Fry, A. C.; B/Kraemer, W. J.; C/Van Borselen, F.; D/Lynch, J. M.; E/Triplett, N. T.; F/Koziris, L. P.; G/Fleck, S. J.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 2, August 1994, P. 941-946

MAJS: /*Catecholamine/*Epinephrine/*Loads (Forces)/*Muscles/*Muscular Strength/* Norepinephrine/*Physical Exercise

MINS: / Autonomic Nervous System/ Exercise Physiology/ Human Beings/ Human Body/ Males/ Stress (Physiology)

ABA: Author (Herner)

ABSTRACT: Seventeen weight-trained males were divided into an overtraining group that weight trained their legs daily dor 2 wk with 100% 1 repetition maximum relative intensity on a squat machine and a control group that exercised 1 day/wk with low relative intensity (50% 1 repetition maximum). Test batteries including strength assessments and resting and exercise-induced concentrations of epinephrine and norepinephrine were conducted at the beginning, middle, and end (tests 1 - 3, respectively) of the study. Strength capabilities decreased by test 3 for the OT group. Resting catecholamine concentrations did not change either group during the study, whereas exercise-induced concentrations of both epinephrine and norepinephrine significantly increased by tests 2 and 3 for only the OT group. Correlation coefficients suggested decreased responsitivity of skeletal muscle to sympathetic nervous system activity. It appears that altered exercise-induced sympathetic nervous system accompanies high relative intensity resistance exercise overtraining and may be among the initial responses to the onset of the previously theoretical sympathetic overtraining syndrome.

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95A68915 ISSUE 5 CATEGORY 51 ***RPT#***: HTN-95-A0132 ISSN 8750-7587 94/08/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Pressure-flow specificity of inspiratory muscle training

AUTHORS: A/Tzelepis, George E.; B/Vega, Diego L.; C/Cohen, Mark E.; D/Fulambarker, Ashok M.; E/Patel, Kishor K.; F/Mccool, F. Dennis

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 2, August 1994, P. 795-801 Research Sponsored By Dept. Of Veterans Affairs And Chicago Lung Association.

MAJS: /*Exercise Physiology/*Muscular Strength/*Physical Fitness/*Pulmonary Functions/*Respiratory Impedance/*Respiratory Physiology

MINS: / Esophagus/ Flow Velocity/ Human Beings/ Human Body/ Inspiration/ Pressure Sensors/ Respiration

ABA: Author (Herner)

ABSTRACT: The inspiratory muscles (IM) can be trained by having a subject breathe through inspiratory resistive loads or by use of unloaded hyperpnea. These disparate training protocols are characterized by high inspiratory pressure or high inspiratory flow, respectively. We tested the hypothesis that the posttraining improvements in IM pressure or flow performance are specific to training protocols in a way that is similar to force-velocity specificity of skeletal muscle training. IM training was accomplished in 15 normal subjects by use of three protocols: high inspiratory pressure-no flow (group A, n = 5), low-inspiratory pressure-high flow (group B, n = 5), and intermediate inspiratory pressure and flow (group C, n = 5). A control group (n = 4) did no training. Before and after training, we measured esophageal pressure (Pes) and inspiratory flow (dot-VI) during single maximal inspiratory efforts against a range of external resistances including an occluded airway.

Efforts originated below relaxation volume (Vrel), and peak Pes and dot-VI were measured at Vrel. Isovolume maximal Pes-dot-VI plots were constructed to assess maximal inspiratory pressure-flow performance. Group A (pressure training) performed 30 maximal static inspiratory maneuvers at Vrel daily, group B (flow training) performed 30 sets of three maximal inspiratory maneuvers with no added external resistance daily, and group C (intermediate training) performed 30 maximal inspiratory efforts on a midrange external resistance (7 mm ID) daily. Subjects trained 5 days/wk for 6 wk. Data analysis included comparison of posttraining Pes-dot-VI slopes among training groups. After training, group A increased maximal Pes (Pes(sub max); 37%) but not maximal dot-VI (dot-VI(sub max)) and group B increased dot-VI(sub max) (17%) but not Pes(sub max); group C increased Pes(sub max) (19%) and dot-VI(sub max) (14%), The posttraining slopes were dependent on the training protocol. We conclude that training protocols characterized by generating high inspiratory pressure or high inspiratory flow will specifically increase Pes(sub max) or dot-VI(sub max), respectively. In contrast, intermediate training protocols produce a more uniform increase in dot-VI(sub max) and flow.

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95A68914 ISSUE 5 CATEGORY 51 ***RPT#***: HTN-95-A0131 ISSN 8750-7587 94/08/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Lung volume specificity of inspiratory muscle training

AUTHORS: A/Tzelepis, George E.; B/Vega, Diego L.; C/Cohen, Mark E.; D/Mccool, F. Dennis

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 2, August 1994, P. 789-794 Research Sponsored By Dept. Of Veterans Affairs And Chicago Lung Association.

MAJS: /*Exercise Physiology/*Muscular Strength/*Physical Fitness/*Pulmonary Functions/*Respiratory Physiology

MINS: / Human Beings/ Human Body/ Inspiration/ Plethysmography/ Respiration

ABA: Author (Herner)

ABSTRACT: We examined the extent to which training-related increases of inspiratory muscle (IM) strength are limited to the lung volume (VL) at which the training occurs. IM strength training consisted of performing repeated static maximum inspiratory maneuvers. Three groups of normal volunteers performed these maneuvers at one of three lung volumes: residual volume (RV), relaxation volume (Vrel), or Vrel plus one-half of inspiratory capacity (Vrel + 1/2IC). A control group did not train. We constructed maximal inspiratory pressure-VL curves before and after a 6-wk training period. For each group, we found that the greatest improvements in strength occurred at the volume at which the subjects trained and were significantly greater for those who trained at low (36% for RV and 26% for Vrel) than at high volumes (13% for Vrel + 1/2IC). Smaller increments in strength were noted at volumes adjacent to the training volume. The range of vital capacity (VC) over which strength was increased was greater for those who trained at low (70% of VC) than at high VL (20% of VC). We conclude that the greatest improvements in IM strength are specific to the VL at which training occurs. However, the increase in strength, as well as the range of volume over which strength in increased, is greater for those who trained at the lower VL.

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95A68899 ISSUE 5 CATEGORY 51 ***RPT#***: HTN-95-A0116 ISSN 8750-7587 CNT#: NIH-PO1-AG-04402 NIH-RO1-AG-07660 NIH-KO8-AG-00494 NIH-MO1-RR-02719 NIH-IT32-AG-00219 94/08/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of strength training on total and regional body composition in older men

AUTHORS: A/Treuth, M. S.; B/Ryan, A. S.; C/Pratley, R. E.; D/Rubin, M. A.; E/Miller, J. P.; F/Nicklas, B. J.; G/Sorkin, J.; H/Harman, S. M.; I/Goldberg, A. P.; J/Hurley, B. F. ***PAA***: A/Maryland Univ., College Park, MD, US; B/Maryland Univ., College Park, MD, US; C/Maryland Univ., College Park, MD, US; D/Maryland Univ., College Park, MD, US; E/Maryland Univ., College Park, MD, US; F/Maryland Univ., College Park, MD, US; G/Maryland Univ., College Park, MD, US; H/Maryland Univ., College Park, MD, US; I/Maryland Univ., College Park, MD, US; J/Maryland Univ., College Park, MD, US

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 77, No. 2, August 1994, P. 614-620

MAJS: /*Adipose Tissues/*Aging (Biology)/*Body Composition (Biology)/*Exercise Physiology/*Muscular Strength/*Physical Fitness

MINS: / Gamma Ray Absorptiometry/ Human Beings/ Human Body/ Males/ Physical Work

ABA: Author (revised by Herner)

ABSTRACT: The effects of a 16-wk strength-training program on total and regional body composition were assessed by dual-energy X-ray absorptiometry (DEXA), magnetic resonance imaging (MRI), and hydrodensitometry in 13 untrained healthy men. Nine additional men served as inactive control. The strength-training program resulted in substantial increases in both upper and lower body strength. Total fat-free mass (FFM) increased by 2 kg, and total fat mass decreased by the same amount when measured by DEXA. When measured by hydrodensitometry, similar increases in FFM and decreases in fat mass were observed. When measured by DEXA, FFM was increased in the arms, legs, and trunk, whereas fat mass was reduced in the arms, legs, and trunk as a result of training. MRI analysis revealed significant increases in midthigh muscle cross-sectional area and significant reductions in midthigh subcutaneous fat. These changes in body composition were not associated with changes in serum concentration of growth hormone, insulin-like growth factor I, or testosterone. None of the measured variables changed significantly in the control subjects. Thus, strength training increases regional and total lean mass and decreases regional and total fat mass in middle-aged and older men.

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95A61915 ISSUE 3 CATEGORY 52 ***RPT#***: HTN-95-10064 ISSN 8750-7587 94/01/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Ventilatory responses to inspiratory threshold loading and role of muscle fatigue in task failure

AUTHORS: A/Eastwood, Peter R.; B/Hillman, David R.; C/Finucane, Kevin E. ***PAA***: A/Univ. of Western Australia, Nedlands, Australia; B/Univ. of Western Australia, Nedlands, Australia; C/Univ. of Western Australia, Nedlands, Australia

CIO: Australia-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 76, No. 1, January 1994, P. 185-195

MAJS: /*Diaphragm (Anatomy)/*Inspiration/*Muscular Fatigue/*Muscular Strength

MINS: / Breathing/ Human Beings/ Human Body/ Physical Fitness/ Respiratory Physiology

ABA: Author (Herner)

ABSTRACT: To examine respiratory muscle recruitment pattern during inspiratory loading and role of fatigue in limiting endurance, we studied seven normal subjects on 17 +/- 6 days during breathing against progressive inspiratory threshold load. Threshold pressure (Pth) was progressively increased 14 +/- 5 cm H2O every 2 min until voluntary cessation (task failure). Subjects could adopt any breathing pattern. Tidal volume (VT), chest wall motion, end-tidal P(CO2), and arterial O2 saturation were measured. At moderate loads (50-75% of maximum Pth (Pth(sub max))), inspiratory time (TI) decreased and VT/TI and expiratory time increased, increasing time for recovery of muscles between inspirations. At high loads (less than 75% Pth(sub max)), VT/TI decreased, which, with progressive decrease in end-expiratory lung volume (EELV) throughout, increased potential for inspiratory force development. Progressive hypoxia and hypercapnia occurred at higher work loads. Immediately after task failure all subjects could recover at high loads and still reachieve initial Pth(sub max) on reimposition of progressive loading. Respiratory pressures were measured in subgroup of three subjects: transdiaphragmatic pressure response to 0.1-ms bilateral supramaximal phrenic nerve stimulation at end expiration initially increased with increasing load/decreasing EELV, consistent with increasing mechanical advantage of diaphragm, but decreased at highest loads, suggesting diaphragm fatigue. Full recovery had not occurred at 30 min after task failure. We demonstrated that progressive threshold loading is associated with systematic changes in breathing pattern that act to optimize muscle strength and increase endurance. Task failure occurred when these compensatory mechanisms were maximal. Inspiratory muscles appeared relatively resistant to fatigue, which was late but persistent.

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95A61912 ISSUE 3 CATEGORY 52 ***RPT#***: HTN-95-10061 ISSN 8750-7587 CNT#: KO8-AG-00494 PO1-AG-04402 RO1-AG-07660 MO1-RR-02719 94/01/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Strength training increases resting metabolic rate and norepinephrine levels in healthy 50- to 65-yr-old men

AUTHORS: A/Pratley, R.; B/Nicklas, B.; C/Rubin, M.; D/Miller, J.; E/Smith, A.; F/Smith, M.; G/Hurley, B.; H/Goldberg, A.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 76, No. 1, January 1994, P. 133-137

MAJS: /*Body Composition (Biology)/*Catecholamine/*Glucose/*Insulin/*Muscular Strength/*Thyroid Gland/*Thyroxine

MINS: / Age Factor/ Aging (Biology)/ Human Beings/ Human Body/ Males/ Metabolism / Norepinephrine/ Physical Exercise

ABA: Author (Herner)

ABSTRACT: Resting metabolic rate (RMR) decreases with age, largely because of an age-related decline in fat-free mass (FFM). We hypothesized that a strength-training program capable of eliciting increases in FFM would also increase RMR in older individuals. To test this hypothesis, RMR, body composition, and plasma concentrations of certain hormones known to affect RMR were measured before and after a 16-wk heavy-resistance strength-training program in 13 healthy men 50-65 yr of age. Average strength levels, assessed by the three-repetition maximum test, increased 40% with training (P less than 0.001). Body weight did not change, but body fat decreased (25.6 +/- 1.5 vs. 23.7 +/- 1.7%; P less than 0.001) and FFM increased (60.6 +/- 2.2 vs. 62.2 +/-2.1 kg; P less than 0.01). RMR,

measured by indirect calorimetry, increased 7.7% with strength training (6,449 +/- 217 vs. 6,998 +/- 226 kJ/24 h; P less than 0.01). This increase remained significant even when RMR was expressed per kilogram of FFM. Strength training increased arterialized plasma norepinephrine levels 36% (1.1 +/- 0.1 vs. 1.5 +/- 0.1 nmol/l; P less than 0.01) but did not change fasting glucose, insulin, or thyroid hormone levels. These results indicate that a heavy-resistance strength-training program increases RMR in healthy older men, perhaps by increasing FFM and sympathetic nervous system activity.

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93A49291 ISSUE 21 PAGE 3922 CATEGORY 52 ISSN 8750-7587 ***CNT#***: RTOP 199-14-12-04 RTOP 199-26-12-38 93/06/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Intramuscular pressure and electromyography as indexes of force during isokinetic exercise

AUTHORS: A/Aratow, M.; B/Ballard, R. E.; C/Grenshaw, A. G.; D/Styf, J.; E/Watenpaugh, D. E.; F/Kahan, N. J.; G/Hargens, A. R. ***PAA***: G/(NASA, Ames Research Center, Moffett Field, CA)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.; National Aeronautics and Space Administration, Washington, DC.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 74, No. 6, June 1993, P. 2634-2640.

MAJS: /*Biodynamics/*Electromyography/*Exercise Physiology/*Physical Exercise

MINS: / Catheterization/ Dynamometers/ Load Distribution (Forces)/ Muscular Strength

ABA: Author (revised)

ABSTRACT: A direct method for measuring force production of specific muscles during dynamic exercise is presently unavailable. Previous studies indicate that both intramuscular pressure (IMP) and electromyography (EMG) correlate linearly with muscle contraction force during isometric exercise. The objective of this study was to compare IMP and EMG as linear assessors of muscle contraction force during dynamic exercise. IMP and surface EMG activity were recorded during concentric and eccentric isokinetic plantarflexion and dorsiflexion of the ankle joint from the tibialis anterior (TA) and soleus (SOL) muscles of nine male volunteers. Ankle torque was measured using a dynamometer, and IMP was measured via catheterization. IMP exhibited better linear correlation than EMG with ankle joint torque during concentric contractions of the SOL and the TA, as well as during eccentric contractions. IMP provides a better index of muscle contraction force than EMG during concentric and eccentric exercise through the entire range of torque. IMP reflects intrinsic mechanical properties of individual muscles, such as length-tension relationships, which EMG is unable to assess.

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93A20036 ISSUE 6 PAGE 1006 CATEGORY 51 ISSN 8750-7587 ***CNT#***: NAG2-392 NGT-50493 92/11/00 10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of insulin and exercise on rat hindlimb muscles after simulated microgravity

AUTHORS: A/Stump, Craig S.; B/Balon, Thomas W.; C/Tipton, Charles M. ***PAA***: C/(Arizona Univ., Tucson; Iowa Univ., Iowa City)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.; National Aeronautics and Space Administration, Washington, DC.

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 73, No. 5, Nov. 1992, P. 2044-2053.
MAJS: /*Atrophy/*Exercise Physiology/*Insulin/*Muscular Strength/*Weightlessness Simulation
MINS: / Bioastronautics/ Glucose/ Glycogens/ Physiological Tests/ Rats
ABA: I.S.
ABSTRACT: The effect of simulated microgravity on the insulin- and exercise-stimulated glucose uptake and metabolism in the hindlimb muscles of rats was investigated using three groups of rats suspended at 45 head-down tilt (SUS) for 14 days: (1) cage control, (2) exercising (treadmill running) control, and (3) rats subjected to suspension followed by exercise (SUS-E). It was found that the suspension of rats with hindlimbs non-weight bearing led to enhanced muscle responses to insulin and exercise, when these stimuli were applied separately. However, the insulin affect appeared to be impaired after exercise for the SUS-E rats, especially for the soleus muscle.

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93A20033 ISSUE 6 PAGE 1005 CATEGORY 51 ISSN 8750-7587 ***CNT#***: NAG2-239 NAGW-70 92/11/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Eccentric exercise training as a countermeasure to non-weight-bearing soleus muscle atrophy
AUTHORS: A/Kirby, Christopher R.; B/Ryan, Mirelle J.; C/Booth, Frank W. ***PAA***: C/(Texas Univ., Houston)
CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.; National Aeronautics and Space Administration, Washington, DC.
CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 73, No. 5, Nov. 1992, P. 1894-1899.
MAJS: /*Atrophy/*Bioastronautics/*Exercise Physiology/*Muscular Strength
MINS: / Hypodynamia/ Hypokinesia/ Physiological Tests
ABA: Author
ABSTRACT: This investigation tested whether eccentric resistance training could prevent soleus muscle atrophy during non-weight bearing. Adult female rats were randomly assigned to either weight bearing +/- intramuscular electrodes or non-weight bearing +/- intramuscular electrodes groups. Electrically stimulated maximal eccentric contractions were performed on anesthetized animals at 48-h intervals during the 10-day experiment. Non-weight bearing significantly reduced soleus muscle wet weight (28-31 percent) and noncollagenous protein content (30-31 percent) compared with controls. Eccentric exercise training during non-weight bearing attenuated but did not prevent the loss of soleus muscle wet weight and noncollagenous protein by 77 and 44 percent, respectively. The potential of eccentric exercise training as an effective and highly efficient counter-measure to non-weight-bearing atrophy is demonstrated in the 44 percent attenuation of soleus muscle noncollagenous protein loss by eccentric exercise during only 0.035 percent of the total non-weight-bearing time period.

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93A15168 ISSUE 3 PAGE 484 CATEGORY 52 ISSN 0131-1646 92/08/00 8 PAGES In RUSSIAN In Russian. UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Contractile properties of the calf triceps muscle in humans exposed to simulated weightlessness

UFTL: Sokratitel'nye svoistva trekhglavoi myshtsy goleni u cheloveka v usloviiakh modeli, imitiruiushchei nevesomost'

AUTHORS: A/Koriak, Iu. A. ***PAA***: A/(TsNII Sport, Moscow, Russia)

CIO: Russia-- Fiziologiia Cheloveka (ISSN 0131-1646), Vol. 18, No. 4, July-Aug. 1992, P. 39-46.

MAJS: /*Bed Rest/*Constrictors/*Muscular Strength/*Muscular Tonus/* Weightlessness

MINS: / Contraction/ Hypodynamia/ Hypokinesia/ Physiological Tests

ABA: I.S.

ABSTRACT: The effect of weightlessness simulated by 120-day-long hypokinetic/hypodynamic stress (bed rest) on the mechanical properties of the calf triceps muscle (CTM) was investigated in human subjects by comparing the morphological and neurophysiological characteristics of the CTM before and after bed rest. The results of measurements of the contractile capability of the CTM and of the rates of arbitrary and nonarbitrary contractions indicate that bed rest caused not only the atrophy of the muscle and a decrease in the muscle's potential to develop maximal force, but also a decrease in the central motor system control of voluntary activity.

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92A50071 ISSUE 21 PAGE 3812 CATEGORY 52 ISSN 8750-7587 92/07/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Hypertrophic response to unilateral concentric isokinetic resistance training

AUTHORS: A/Housh, Dona J.; B/Housh, Terry J.; C/Johnson, Glen O.; D/Chu, Wei-Kom ***PAA***: D/(Nebraska, University, Medical Center, Lincoln and Omaha)

CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 73, No. 1, July 1992, P. 65-70. Research Supported By University Of Nebraska.,

MAJS: /*Exercise Physiology/*Flexors/*Forearm/*Leg (Anatomy)/*Muscular Function

MINS: / Aerospace Medicine/ Muscular Strength/ Physical Fitness/ Training Analysis

ABA: I.S.

ABSTRACT: The effect of concentric isokinetic training on the strength and the cross-sectional area (CSA) of selected extensor and flexor muscles of the forearm and leg was determined in young human subjects asked to perform six sets of 10 repetitions each of extension and flexion of nondominant limbs, three times per week for eight weeks. Pretraining and posttraining peak torque and muscle CSA were measured using a Cybex II isokinetic dynamometer and the Cybex dynamometer together with magnetic resonance imaging scanner, respectively. Results indicated significant hypertrophy in all trained muscle groups in nondominant (but not in the contralateral dominant) limbs, as well as preferential hypertrophy of individual muscles and at specific levels. The peak torque did not increase significantly for trained leg extension or for any movement in the contralateral limbs.

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92A35352* ISSUE 14 PAGE 2432 CATEGORY 51 ISSN 8750-7587 ***CNT#***: NAG2-568 92/04/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Training-induced alterations in young and senescent rat diaphragm muscle

AUTHORS: A/Gosselin, Luc E.; B/Betlach, Michael; C/Vailas, Arthur C.; D/Thomas, D. P. ***PAA***: D/(Wisconsin, University, Madison; Wyoming, University, Laramie)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
CIO: United States-- Journal Of Applied Physiology (ISSN 8750-7587), Vol. 72, No. 4, April 1992, P. 1506-1511. Research Supported By University Of Wisconsin.,
MAJS: /*Diaphragm (Anatomy)/*Exercise Physiology/*Muscular Strength/* Physiological Responses
MINS: / Aging (Biology)/ Capillaries (Anatomy)/ Rats
ABA: I.S.
ABSTRACT: The effect of progressive treadmill exercise on oxidative capacity in three specific diaphragm muscle fiber types and on the capillary density of known fiber types was investigated in young (5 month) and senescent (23 months or older) rats. All animals were trained for 1 hr/day, 5 days weekly, for 10 weeks. Measurements of succinate dehydrogenase activity showed significant increases in all three fiber types in both the young and the senescent trained animals, compared with their sedentary controls. Fiber size and capillary density were not affected by exercise or age. The results demonstrate that the senescent costal diaphragm maintains its ability to adapt to an increased metabolic demand brought about by locomotor exercises.

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91A39540* ISSUE 16 PAGE 2775 CATEGORY 52 ISSN 0095-6562 ***CNT#***: NAS10-10285 NAS10-11624 91/06/00 8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Importance of eccentric actions in performance adaptations to resistance training
AUTHORS: A/Dudley, Gary A.; B/Miller, Bruce J.; C/Buchanan, Paul; D/Tesch, Per A. ***PAA***: B/(Bionetics Corp., Cocoa Beach, FL); C/(NASA, Kennedy Space Center, Cocoa Beach, FL); D/(Karolinska Institutet, Stockholm, Sweden)
CORP: Bionetics Corp., Cocoa Beach, FL.; National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.; Karolinska Inst., Stockholm (Sweden).
CIO: United States-- Aviation, Space, And Environmental Medicine (ISSN 0095-6562), Vol. 62, June 1991, P. 543-550.,
MAJS: /*Bioastronautics/*Muscular Strength/*Muscular Tonus/*Physiological Tests /*Space Flight Stress
MINS: / Astronaut Training/ Exercise Physiology/ Physical Exercise/ Physiological Responses
ABA: I.S.
ABSTRACT: The importance of eccentric (ecc) muscle actions in resistance training for the maintenance of muscle strength and mass in hypogravity was investigated in experiments in which human subjects, divided into three groups, were asked to perform four-five sets of 6 to 12 repetitions (rep) per set of three leg press and leg extension exercises, 2 days each weeks for 19 weeks. One group, labeled ‘con’, performed each rep with only concentric (con) actions, while group con/ecc with performed each rep with only ecc actions; the third group, con/con, performed twice as many sets with only con actions. Control subjects did not train. It was found that resistance training wih both con and ecc actions induced greater increases in muscle strength than did training with only con actions.

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91A33317 ISSUE 13 PAGE 2186 CATEGORY 52 ISSN 0161-7567 91/04/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Metabolic and work efficiencies during exercise in Andean natives

AUTHORS: A/Hochachka, P. W.; B/Stanley, C.; C/Matheson, G. O.; D/Mckenzie, D. C. ; E/Allen, P. S. ***PAA***: E/(British Columbia, University, Vancouver; Simon Fraser University, Burnaby; Alberta, University, Edmonton, Canada)

CIO: Canada-- Journal Of Applied Physiology (ISSN 0161-7567), Vol. 70, April 1991, P. 1720-1730. Research Supported By NSERC, Medical Research Council Of Canada, And Alberta Heritage Foundation For Medical Research.,

MAJS: /*Human Beings/*Hypoxia/*Muscular Fatigue/*Muscular Strength/*Oxygen Metabolism/*Physical Exercise

MINS: / Aerospace Medicine/ Andes Mountains (South America)/ High Altitude Breathing

ABA: O.G.

ABSTRACT: During exercise to fatigue in 4200 m environment, Quechua natives accumulate plasma lactate to concentrations that are only one-third to one-half the values observed in lowlanders. The phenomenon of low lactate accumulation despite hypobaric hypoxia is known as the lactate paradox. It is suggested that the lactate paradox is either a developmentally or a genetically fixed metabolic characteristic of Quechua people that maximizes the amount of ATP obtained per mole of carbon substrate catabolized. The plasma metabolic data indicate that a substantial improvement in energetic efficiency of muscle work at submaximal rates minimizes the need for anaerobic sources of ATP. As plots of power output vs metabolic power input did not extrapolate to the origin, it is concluded that exercise in both groups sustains a significant ATP expenditure not convertible to mechanical work, but that this expenditure is downregulated in Andean natives by unexplained mechanisms.

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90A43456# ISSUE 19 PAGE 3081 CATEGORY 52 ISSN 0387-0723 88/06/00 11 PAGES UNCLASSIFIED DOCUMENT

TITLE: Relationship between +Gz tolerance and physical characteristics during gradual and rapid onset runs

AUTHORS: A/Mizumoto, Chieko ***PAA***: A/(Air Self-Defense Force, Aeromedical Laboratory, Tachikawa, Japan)

CIO: Japan-- Japanese Journal Of Aerospace And Environmental Medicine (ISSN 0387-0723), Vol. 25, June 1988, P. 37-47.,

MAJS: /*Acceleration Tolerance/*Aircraft Pilots/*Gravitational Physiology/* Physical Fitness/*Physiological Effects

MINS: / Abdomen/ Acceleration Stresses (Physiology)/ Correlation Coefficients/ Hydrostatics/ Muscular Strength/ Peripheral Vision

ABA: I.S.

ABSTRACT: The relationship between the +Gz tolerance (evaluated at the point of losing peripheral vision) of pilots and the characteristics of the body built parameters of the pilot was investigated in 123 JASDF F-15 pilots during gradual-onset and rapid-onset runs (GORs and RORs, respectively) in a human-centrifuge. Results showed a significant difference between the two types of tests. In the GOR tests, the +Gz tolerance was found to correlate significantly with the eye-heart distance and the upper-body dimensions (such as the chest and the arm circumferences), indicating that the GOR tolerance is affected by the hydrostatic effect of +Gz. In the ROR tests, the +Gz tolerance correlated with the abdominal strength, the body fat ratio, and the skin-fold thickness, suggesting that the ROR tolerance is affected by the orthostatic effect of +Gz.

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89A26649* ISSUE 9 PAGE 1392 CATEGORY 52 ISSN 0161-7567 ***CNT#***: NAG2-212 89/01/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effect of swim exercise training on human muscle fiber function

AUTHORS: A/Fitts, R. H.; B/Costill, D. L.; C/Gardetto, P. R. ***PAA***: C/(Marquette University, Milwaukee, WI; Ball State University, Muncie, IN)

CORP: Marquette Univ., Milwaukee, WI.; Ball State Univ., Muncie, IN.

CIO: United States-- Journal Of Applied Physiology (ISSN 0161-7567), Vol. 66, Jan. 1989, P. 465-475. Research Supported By The U.S. Olympic Committee.,

MAJS: /*Human Performance/*Muscular Fatigue/*Physical Exercise/*Physical Fitness /*Swimming

MINS: / Biochemistry/ Fibers/ Muscular Strength

ABA: I.S.

ABSTRACT: The effect of swim exercise training on the human muscle fiber function was investigated in swimmers trained in a typical collegiate swim-training program followed by an intensified 10-day training period. The measured parameters included the peak tension (P0), negative log molar Ca(2+) concentration (pCa)-force, and maximal shortening speed (Vmax) of the slow-twitch type I and fast-twitch type II fibers obtained by biopsy from the deltoid muscle. The P0 values were found to be not altered after either the training or the 10-day intensive program. The type I fibers from the trained swimmers showed pCa-force curves shifted to the right, such that higher free Ca(2+) levels were required to elicit a given percent of P0. The training program significantly increased the Vmax in the type I fibers and decreased that of the type II fibers, and the 10-day intensive training produced a further significant decrease of the type II fibers.

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87A50314 ISSUE 22 PAGE 3632 CATEGORY 52 ISSN 0095-6562 87/08/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of hydraulic resistance circuit training on physical fitness components of potential relevance to +Gz tolerance

AUTHORS: A/Jacobs, Ira; B/Bell, Douglas G.; C/Pope, Jan; D/Lee, Wayne ***PAA***: D/(Defence and Civil Institute of Environmental Medicine, Toronto, Canada)

CIO: Canada-- Aviation, Space, And Environmental Medicine (ISSN 0095-6562), Vol. 58, Aug. 1987, P. 754-760.,

MAJS: /*Acceleration Tolerance/*Exercise Physiology/*Gravitational Physiology/* Muscular Strength/*Physical Fitness/*Pilot Performance

MINS: / Anthropometry/ Armed Forces (Foreign)/ Canada/ Respiratory Physiology/ Statistical Analysis/ Training Evaluation

ABA: I.S.

ABSTRACT: A strength-training program for high-performance aircraft crew, designed to improve +Gz acceleration tolerance, is described. The 12 weeks of training involved hydraulic resistance circuit training 2-4 times/week. The following variables were measured: maximal strength of several large muscle groups during isokinetic contractions, maximal aerobic power and an endurance fitness index, maximal anaerobic power, anthropometric characteristics, and maximal expiratory pressure generated during exhalation. The exercise:rest ratio was 20:40 s for the first 4 weeks, and was then increased to 30:50 s. The training was found to induce small, but significant, increases in maximal

strength of several large muscle groups, as well as significant improvements of the indicators of endurance fitness. Neither maximal anaerobic power (i.e., muscular endurance) nor maximal expiratory pressure were changed.

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87A40298* ISSUE 17 PAGE 2725 CATEGORY 52 ISSN 0161-7567 ***CNT#***: NASA ORDER T-5043-J 87/04/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of exercise and conditioning on clotting and fibrinolytic activity in men

AUTHORS: A/Ferguson, Earl W.; B/Bernier, Lani L.; C/Banta, Guy R.; D/Yu-Yahiro, Janet; E/Schoomaker, Eric B. ***PAA***: E/(Uniformed Services University of Health Sciences, Bethesda, MD)

CORP: Uniformed Services Univ. of the Health Sciences, Bethesda, MD.

CIO: United States-- Journal Of Applied Physiology (ISSN 0161-7567), Vol. 62, April 1987, P. 1416-1421. Research Supported By The Uniformed Services University Of Health Sciences.,

MAJS: /*Blood Coagulation/*Clotting/*Fibrin/*Physical Fitness

MINS: / Biodegradation/ Health/ Physical Work

ABA: I.F.

ABSTRACT: Blood clotting and fibrinolytic activity in three groups of nonsmoking, nonobese, healthy men ranging from 19 to 59 years are studied. The groups consisted of (1) marathoners (men running more than 50 miles/week); (2) joggers (men running 5-15 miles/week; and (3) sedentary subjects (men who did not exercise routinely). It is observed that the rate of blood clotting is accelerated by exercise; marathoners had greater increases in fibrinolytic activity than the other two groups; and fibrin degradation products increased with exercise. The data reveal that the changes in clotting assays with exercise do not correlate with changes in whole blood lactate, blood pyruvate, or rectal temperatures. It is noted that the level of acceleration for fibrinolytic activity is directly related to the maximum aerobic capacity and work load of the individual, and that conditioning enhances the fibrinolytic response to exercise.

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86A28098# ISSUE 12 PAGE 1729 CATEGORY 52 ISSN 0023-2858 85/09/00 16 PAGES In JAPANESE UNCLASSIFIED DOCUMENT

TITLE: The effects of circuit weight training and G experience on +Gz tolerance

AUTHORS: A/Mizumoto, C.; B/Iwane, M.

CIO: Japan-- Japan Air Self Defence Force, Aeromedical Laboratory, Reports (ISSN 0023-2858), Vol. 26, Sept. 1985, P. 105-120. In Japanese, With Abstract In English.,

MAJS: /*Acceleration Tolerance/*Aerospace Medicine/*Exercise Physiology/* Gravitational Physiology/*Physical Exercise

MINS: / Muscular Function/ Physiological Acceleration/ Psychological Factors

ABA: I.F.

ABSTRACT: Two experiments evaluating the G tolerance of ten men ranging in age from 21-32 years are described. Four men were subjected to G force and their tolerance was estimated, and the other six men performed circuit weight training (CWT). Graphs of G tolerance changes for the ten subjects are presented and analyzed. The data reveal that exposure to G force once a week for four weeks does not affect G tolerance. In the men subjected to CWT for eight weeks, four men increased their G tolerance by 0.5-0.8 G, one displayed no

change in tolerance, and the sixth decreased G tolerance by 0.4G; a correlation between femoral muscle strength and G tolerance is observed. It is concluded that short periods of CWT will increase peak G tolerance.

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85A42529 ISSUE 20 PAGE 2996 CATEGORY 52 ISSN 0003-0996 85/08/00 10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Physiological adaptations to aerobic training

AUTHORS: A/Nadel, E. R. ***PAA***: A/(Yale University, New Haven, CT)

CIO: United States-- American Scientist (ISSN 0003-0996), Vol. 73, July-Aug. 1985, P. 334-343.,

MAJS: /*Blood Volume/*Cardiovascular System/*Exercise Physiology/*Muscular Fatigue/*Oxygen Consumption/*Physical Fitness

MINS: / Adenosine Triphosphate/ Energy Conversion/ Glycolysis/ Heat Transfer/ Muscular Strength/ Thermoregulation

ABA: M.S.K.

ABSTRACT: Physiological factors which increase physical endurance are discussed. Fatigue occurs in slow twitch muscle fibers as they become depleted of their glycogen reserves. Constant regeneration of adenosine triphosphate (ATP), from which muscle energy is released by hydrolysis, powers sustained muscular exertion. Re-energization is accomplished by delivering sufficient oxygen to the ATP breakdown product, adenosine diphosphate (ADP). Complete depletion of the ATP supply is inhibited by a build-up of anaerobic byproducts, which lower the muscle pH values. Extramuscular substrates cannot be used as reservoirs fast enough to offset fatigue in prolonged exercise. Daily physical activity enhances the ability to deliver oxygen through increased pulmonary ventillation rates. The oxygen supply can then, at 50 percent maximum power, keep the muscle reactions completely aerobic. Data indicate that the functions of all physiological systems related to resistance to fatigue are altered by regular, strenuous physical exercise. The most significant change is increased blood volume, which benefits several bodily functions related to maintaining power output.

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85A42132 ISSUE 20 PAGE 2996 CATEGORY 52 84/00/00 152 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Certain methods of the functional examination of athletes --- Russian book

UFTL: Nekotorye metody funktsional'nogo issledovaniia sportsmenov

AUTHORS: A/Svanishvili, R.

CIO: Ussr-- Tbilisi, Izdatel'stvo Sabchota Sakartvelo, 1984, 152 P. In Russian.,

MAJS: /*Examination/*Exercise Physiology/*Sports Medicine

MINS: / Adaptation/ Athletes/ Autonomic Nervous System/ Cardiology/ Cardiovascular System/ Heart Function/ Hemodynamic Responses/ Human Performance/ Muscular Function/ Neuromuscular Transmission/ Physical Exercise/ Physical Work/ Sensorimotor Performance/ Work Capacity

ABA: B.J.

ABSTRACT: Problems of functional examination in sports medicine are examined, taking into account athletic specialization and the nature of the training. The hemodynamic, cardiodynamic, vegetative-nervous, and neuromuscular functional indices of athletes in a

state of rest are examined. Also considered are features characterizing the physiological adaptation of athletes to dynamic factors; attention is given to a combined functional test of the cardiovascular system, cardiodynamics during physical exercise, and physical work capacity.

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85A35400 ISSUE 16 PAGE 2384 CATEGORY 54 ISSN 0014-0139 85/03/00 11 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Sleep deprivation, chronic exercise and muscular performance

AUTHORS: A/Takeuchi, L.; B/Davis, G. M.; C/Plyley, M.; D/Goode, R.; E/Shephard, R. J. ***PAA***: E/(Toronto, University, Toronto, Canada)

CIO: Canada-- Ergonomics (ISSN 0014-0139), Vol. 28, March 1985, P. 591-601. Research Supported By The Defence And Civil Institute Of Environmental Medicine.,

MAJS: /*Chronic Conditions/*Human Performance/*Muscular Function/*Physical Exercise/*Sleep Deprivation

MINS: / Industrial Safety/ Muscular Strength/ Oxygen Consumption/ Physical Work

ABA: Author

ABSTRACT: Muscular performance was tested during 64 hours of sleep deprivation with and without intermittent exercise (treadmill walking of 28 percent of maximum oxygen intake). The subjects (12 males aged 22.7 + or - 2.2 years) carried out a cross-over trial with an 8 week interval separating the two periods of sleep deprivation. The sleep deprivation did not change the time for a 40 m dash, isometric handgrip force or balance (stabilometer test). Vertical jump height decreased, the change being significant for simple sleep deprivation, but not for the combination of deprivation and intermittent exercise. Sleep deprivation decreased isokinetic extension force at 60 deg/s, while intermittent walking decreased isokinetic extension force at both 60 and 180 deg/s; however, there was no significant difference between exercise plus sleep deprivation and sleep deprivation alone at either angular velocity. It is concluded that the modern intensity of physical activity likely in industrial work has little influence upon human performance under conditions of sleep deprivation.

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85A33860 ISSUE 15 PAGE 2226 CATEGORY 52 ISSN 0095-6562 85/02/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Isometric abdominal muscle training and G tolerance

AUTHORS: A/Balldin, U. I.; B/Myhre, K.; C/Tesch, P. A.; D/Wilhelmsen, U.; E/Andersen, H. T. ***PAA***: E/(Karolinska Institutet; Forsvarets Forskningsanstalt, Stockholm, Sweden; Royal Norwegian Air Force, Institute of Aviation Medicine, Oslo, Norway)

CIO: Sweden-- Aviation, Space, And Environmental Medicine (ISSN 0095-6562), Vol. 56, Feb. 1985, P. 120-124.,

MAJS: /*Abdomen/*Acceleration Tolerance/*Flight Stress (Biology)/*Muscular Strength/*Physical Exercise/*Pilot Training

MINS: / Aerospace Medicine/ Gravitational Physiology/ Human Centrifuges/ Muscular Fatigue

ABA: Author

ABSTRACT: Methods to increase G tolerance of pilots flying high-performance aircraft are of vital importance. Straining maneuvers to increase G tolerance involve abdominal muscles, and high intra-abdominal pressures (IAP) are recorded during G exposure. This study was

carried out to examine the effects of an 11-week abdominal muscle training program on maximal IAP, G tolerance and muscle strength/endurance in 10 fighter pilots. G tolerance was measured in a human centrifuge using simulated aerial combat maneuvers (ACM). The pilots had a higher maximal IAP before training than a control group. G tolerance, maximal IAP, and maximal peak torque of knee extensors were not changed by the training. In contrast, leg muscle endurance increased (p less than 0.01) and ratings of local perceived exertion decreased (p less than 0.01). Static endurance of the knee extensors was positively correlated (p less than 0.05) with G tolerance. It is concluded that the present abdominal training program, employed in experienced fighter pilots, is not sufficient to increase IAP or G tolerance.

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85A27777 ISSUE 11 PAGE 1604 CATEGORY 52 ISSN 0131-1646 85/02/00 6 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Relationship between values of voluntary muscular force and features of adaptation of skeletal muscles to force loads in males and females

UFTL: Sootnoshenie velichin proizvol'noi myshechnoi sily i osobennosti adaptatsii skeletnoi muskulatury k silovym nagruzkam y zhenshchin i muzhchin

AUTHORS: A/Issurin, V. B.; B/Sharobaiko, I. V. ***PAA***: B/(Leningradskii Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Leningrad, USSR)

CIO: Ussr-- Fiziologiia Cheloveka (ISSN 0131-1646), Vol. 11, Jan.-Feb. 1985, P. 17-22. In Russian.,

MAJS: /*Exercise Physiology/*Muscular Function/*Muscular Strength/*Sex Factor/* Stress (Physiology)

MINS: / Anthropometry/ Athletes/ Body Size (Biology)/ Females/ Males

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85A26667* ISSUE 11 PAGE 1602 CATEGORY 52 ISSN 0095-6562 85/03/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Plasma lactic dehydrogenase activities in men during bed rest with exercise training

AUTHORS: A/Greenleaf, J. E.; B/Juhos, L. T.; C/Young, H. L. ***PAA***: A/(NASA, Ames Research Center, Laboratory for Human Environmental Physiology, Moffett Field, CA); B/(NASA, Ames Research Center, Laboratory for Human Environmental Physiology, Moffett Field; SRI International, Menlo Park, CA); C/(NASA, Ames Research Center, Laboratory for Human Environmental Physiology, Moffett Field; U.S. Environmental Protection Agency, San Francisco, CA)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.; SRI International Corp., Menlo Park, CA.; Environmental Protection Agency, San Francisco, CA.

CIO: United States-- Aviation, Space, And Environmental Medicine (ISSN 0095-6562), Vol. 56, March 1985, P. 193-198.,

MAJS: /*Bed Rest/*Enzyme Activity/*Exercise Physiology/*Oxygen Consumption/*Work Capacity

MINS: / Blood Plasma/ Hydrostatic Pressure/ Males/ Muscular Strength/ Physiochemistry

ABA: I.H.

ABSTRACT: Peak oxygen uptake and the activity of lactic dehydrogenase (LDH-T) and its five isoenzymes were measured by spectrophotometer in seven men before, during, and after

bed rest and exercise training. Exercise training consisted of isometric leg exercises of 250 kcal/hr for a period of one hour per day. It is found that LDH-T was reduced by 0.05 percent in all three regimens by day 10 of bed rest, and that the decrease occurred at different rates. The earliest reduction in LDH-T activity in the no-exercise regimen was associated with a decrease in peak oxygen uptake of 12.3 percent. It is concluded that isometric (aerobic) muscular strength training appear to maintain skeletal muscle integrity better during bed rest than isotonic exercise training. Reduced hydrostatic pressure during bed rest, however, ultimately counteracts the effects of both moderate isometric and isotonic exercise training, and may result in decreased LDH-T activity.

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85A22511 ISSUE 8 PAGE 1084 CATEGORY 52 ISSN 0040-3601 84/09/00 1 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The significance of strength building in the physical education of female students

UFTL: Znachenie silovoi podgotovki v fizicheskom vospitanii studentok

AUTHORS: A/Zabavnikova, I. V.; B/Zabavnikov, A. P. ***PAA***: B/(Kolomenskii Pedagogicheskii Institut, Kolomna, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), Sept. 1984, P. 51. In Russian.,

MAJS: /*Exercise Physiology/*Females/*Muscular Strength/*Tolerances (Physiology) /*Work Capacity/*Workloads (Psychophysiology)

MINS: / Age Factor/ Health Physics/ Stress (Physiology)

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85A22506 ISSUE 8 PAGE 1083 CATEGORY 52 ISSN 0040-3601 84/09/00 1 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Diurnal variability of the velocity-force components of the motor function

UFTL: Variativnost' dvizhenii skorostno-silovogo kharaktera v techenie dnia

AUTHORS: A/Zueva, I. A. ***PAA***: A/(Krasnodarskii Gosudarstvennyi Institut Fizicheskoi Kul'tury, Krasnodar, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), Sept. 1984, P. 26. In Russian.,

MAJS: /*Biodynamics/*Circadian Rhythms/*Muscular Function/*Muscular Strength

MINS: / Electromyography/ Physiological Tests

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85A19036 ISSUE 6 PAGE 773 CATEGORY 52 ISSN 0040-3601 84/07/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Optical multivibration as a method for the medical monitoring of people engaging in physical exercise and athletics

UFTL: Svetovaia mul'tivibratsiia kak metod vrachebnogo kontrolia za zanimaiushchimisia fizkul'turoi i sportom

AUTHORS: A/Sautkin, M. F.; B/Poliakov, A. P.; C/Reshetov, V. G. ***PAA***: C/(Riazanskii Meditsinskii Institut, Ryazan, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), July 1984, P. 31, 32. In Russian.,

MAJS: /*Critical Flicker Fusion/*Fatigue (Biology)/*Physical Exercise/* Physiological Tests/*Vibration Perception/*Work Capacity
MINS: / Central Nervous System/ Health Physics/ Light (Visible Radiation)/ Muscular Strength/ Stress (Physiology)

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85A19027 ISSUE 6 PAGE 773 CATEGORY 52 ISSN 0040-3601 84/07/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Investigation of physical work capacity in athletes according to the PWC170 test
UFTL: Ob izuchenii fizicheskoi rabotosposobnosti u sportsmenov po testu PWC170
AUTHORS: A/Svanishvili, R. A. ***PAA***: A/(Tbilisskii Meditsinskii Institut, Tbilisi, Georgian SSR)
CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), July 1984, P. 16, 17. In Russian.,
MAJS: /*Athletes/*Physical Work/*Physiological Tests/*Work Capacity
MINS: / Competition/ Human Tolerances/ Muscular Strength/ Oxygen Consumption

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85A18904 ISSUE 6 PAGE 771 CATEGORY 52 ISSN 0161-7567 84/12/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Effect of a 42.2-km footrace and subsequent rest or exercise on muscular strength and work capacity
AUTHORS: A/Sherman, W. M.; B/Armstrong, L. E.; C/Murray, T. M.; D/Hagerman, F. C.; E/Costill, D. L.; F/Staron, R. C.; G/Ivy, J. L. ***PAA***: A/(Texas A & M University, College Station, TX; Ball State University, Muncie, IN; Ohio University, Athens, OH); F/(Ball State University, Muncie, IN; Ohio University, Athens, OH); G/(Texas, University, Austin, TX; Ball State University, Muncie, IN; Ohio University, Athens, OH)
CIO: United States-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology (ISSN 0161-7567), Vol. 57, Dec. 1984, P. 1668-1673.,
MAJS: /*Exercise Physiology/*Muscular Function/*Muscular Strength/*Running/*Work Capacity/*Work-Rest Cycle
MINS: / Athletes/ Experiment Design/ Physiological Responses/ Physiological Tests/ Statistical Analysis

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85A17156 ISSUE 5 PAGE 632 CATEGORY 52 ISSN 0040-3601 84/02/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Comparative analysis of effects of static (isometric) and dynamic (isokinetic) exercise training
UFTL: Sravnitel'nyi analiz effektov staticheskoi /izometricheskoi/ i dinamicheskoi /izokineticheskoi/ silovykh trenirovok
AUTHORS: A/Bravaia, D. Iu. ***PAA***: A/(Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR)
CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), Feb. 1984, P. 18-20. In Russian.,
MAJS: /*Muscular Function/*Muscular Strength/*Physical Exercise/*Physiological Effects/*Stress (Physiology)

MINS: / Exercise Physiology/ Physiological Tests

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84A40900 ISSUE 19 PAGE 2810 CATEGORY 52 ISSN 0026-9050 84/05/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effect of voyage conditions and physical exercise on the health and work capacity of seamen

UFTL: O vliianii uslovii plavaniia i fizicheskikh uprazhnenii na zdorov'e i rabotosposobnost' moriakov

AUTHORS: A/Korovaev, V. M.

CIO: Ussr-- Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), May 1984, P. 48, 49. In Russian.,

MAJS: /*Health Physics/*Operator Performance/*Physical Exercise/*Physiological Effects/*Swimming/*Work Capacity

MINS: / Muscular Strength/ Navy/ Physiological Tests

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84A30349 ISSUE 13 PAGE 1947 CATEGORY 52 ***CNT#***: NTNF-11745 83/00/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The effect of immobilization and training on strength and composition of human skeletal muscle

AUTHORS: A/Hermansen, L.; B/Vollestad, N. K.; C/Gronnerod, O.; D/Staff, P. H.; E/Daljord, O. A. ***PAA***: C/(Institute of Muscle Physiology, Oslo, Norway); E/(Ullevaal Hospital, Oslo, Norway)

CIO: Norway-- ***In***: Space physiology; Colloquium, Toulouse, France, March 1-4, 1983, Proceedings (A84-30326 13-52). Toulouse, France, Cepadues-Editions, 1983, p. 255-266. Research supported by the Ministry for Local Government and Labour; Norges Teknisk-Naturvitenskapelige Forskningsrad.,

MAJS: /*Histochemical Analysis/*Immobilization/*Muscular Strength/*Physical Exercise/*Physiological Effects

MINS: / Aerospace Medicine/ Contraction/ Human Body/ Hypokinesia/ Muscular Function

ABA: T.K.

ABSTRACT: The response of human skeletal muscle to immobilization or endurance training is characterized in a review of clinical and experimental studies. Training is found to increase muscle size and strength by increasing the cross-sectional area of the individual fibers, and to increase the percentage of type IIA and IIAB fibers relative to IIB; immobilization has the opposite effects. The percentage of type I fibers and the total number of fibers are unaffected by either procedure.

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84A23927 ISSUE 9 PAGE 1290 CATEGORY 52 ISSN 0161-7567 84/02/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Isometric or dynamic training - Differential effects on mechanical properties of a human muscle

AUTHORS: A/Duchateau, J.; B/Hainaut, K. ***PAA***: B/(Bruxelles, UniversiteLibre, Brussels, Belgium)

CIO: Belgium-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology (ISSN 0161-7567), Vol. 56, Feb. 1984, P. 296-301. Research Supported By The

Fonds National De La Recherche Scientifique And Fonds De La Recherche Scientifique Medicale.,

MAJS: /*Exercise Physiology/*Mechanical Properties/*Muscular Function/*Muscular Strength

MINS: / Adaptation/ Bioelectricity/ Contraction/ Human Body/ Physical Exercise/ Physiological Effects

ABA: C.M.

ABSTRACT: The effects of three months, (ten minutes daily), of moderate, isometric or dynamic voluntary exercise on the contractile properties of the human adductor pollicis muscle in males and females (17-30 years old) are examined. Maximal muscle strength increased by 20 percent in subjects performing isometric contractions, and by 11 percent in subjects performing dynamic contractions. Isometric training, possibly by effecting greater contractile myofibrillar protein synthesis, increases the speed of movement against high mechanical resistance, while dynamic training increases the speed of movement against light loads. Isometric and dynamic exercises also differ in their effects on twitch force, twitch tension and relaxation development, contraction time, half relaxation time, and maximal shortening velocity. Since human muscle contraction kinetics adapts specifically to the type of contraction exercise, training programs should be especially designed for the type of effort required of the athlete.

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84A18814 ISSUE 6 PAGE 809 CATEGORY 54 82/00/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Development of a human atlas of strengths

AUTHORS: A/Hafez, H. A.; B/Gidcumb, C. F.; C/Reeder, M. J.; D/Beshir, M. Y.; E/Ayoub, M. M. ***PAA***: E/(Texas Tech University, Lubbock, TX)

CIO: United States-- ***In***: Human Factors Society, Annual Meeting, 26th, Seattle, WA, October 25-29, 1982, Proceedings (A84-18776 06-54). Santa Monica, CA, Human Factors Society, 1982, p. 575-579. Research supported by the Douglas Aircraft Co. and Andrulis Research Corp.,

MAJS: /*Anthropometry/*Biodynamics/*Human Performance/*Muscular Strength/* Physiological Tests/*Sex Factor

MINS: / Dynamic Tests/ Joints (Anatomy)/ Static Tests/ Torque

ABA: O.C.

ABSTRACT: Male and female samples of 25 college students each were assessed for dynamic and static maximal strengths at five body joints (elbow, shoulder, lower back, hip, and knee) in order to compile values for an atlas of operator strengths. At the static, 5 rpm, and 25 rpm speeds of the tests, torque exertions began at different positions and covered a specified motion range for dynamic measurements. Study results are discussed.

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83A43990* ISSUE 21 PAGE 3186 CATEGORY 52 ISSN 0095-0562 83/08/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Handgrip and general muscular strength and endurance during prolonged bedrest with isometric and isotonic leg exercise training

AUTHORS: A/Greenleaf, J. E.; B/Starr, J. C.; C/Van Beaumont, W.; D/Convertino, V. A. ***PAA***: B/(NASA, Ames Research Center, Laboratory of Human Environmental Physiology, Moffett Field, CA); C/(NASA, Ames Research Center, Laboratory of Human

Environmental Physiology, Moffett Field, CA; St. Louis University, St. Louis, MO); D/(NASA, Ames Research Center, Laboratory of Human Environmental Physiology, Moffett Field, CA; Arizona, University, Tucson, AZ)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.; Saint Louis Univ., MO.; Arizona Univ., Tucson, AZ.

CIO: United States-- Aviation, Space, And Environmental Medicine (ISSN 0095-0562), Vol. 54, Aug. 1983, P. 696-700. NASA-Supported Research.,

MAJS: /*Bed Rest/*Long Term Effects/*Muscular Strength/*Physical Exercise/* Physiological Effects

MINS: / Aerospace Medicine/ Hand (Anatomy)/ Leg (Anatomy)/ Work Capacity/ Workloads (Psychophysiology)

ABA: N.B.

ABSTRACT: Measurements of maximal grip strength and endurance at 40 percent max strength were obtained for 7 men 19-21 years of age, 1-2 days before and on the first recovery day during three 2-week bedrest (BR) periods, each separated by a 3-week ambulatory recovery period. The subjects performed isometric exercise (IME) for 1 hr/day, isotonic exercise (ITE) for 1 hr/day, and no exercise (NOE) in the three BR periods. It was found that the mean maximal grip strength was unchanged after all three BR periods. Mean grip endurance was found to be unchanged after IME and ITE training, but was significantly reduced after NOE. These results indicate that IME and ITE training during BR do not increase or decrease maximal grip strength, alghough they prevent loss of grip endurance, while the maximal strength of all other major muscle groups decreases in proportion to the length of BR to 70 days. The maximal strength reduction of the large muscle groups was found to be about twice that of the small muscle groups during BR. In addition, it is shown that changes in maximal strength after spaceflight, BR, or water immersion deconditioning cannot be predicted from changes in submaximal or maximal oxygen uptake values.

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83A43989 ISSUE 21 PAGE 3186 CATEGORY 52 ISSN 0095-0562 83/08/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of strength training on g tolerance

AUTHORS: A/Tesch, P. A.; B/Hjort, H.; C/Balldin, U. I. ***PAA***: C/(Karolinska Institutet; Forsvarets Forskningsanstalt, Stockholm, Sweden)

CIO: Sweden-- Aviation, Space, And Environmental Medicine (ISSN 0095-0562), Vol. 54, Aug. 1983, P. 691-695. Research Supported By The Swedish Air Force.,

MAJS: /*Acceleration Tolerance/*Aircraft Pilots/*Human Tolerances/*Physical Exercise/*Physiological Effects/*Pilot Training

MINS: / Aircraft Maneuvers/ Combat/ Fighter Aircraft/ Human Centrifuges/ Muscular Strength

ABA: N.B.

ABSTRACT: The g tolerance of humans was investigated in a centrifuge using simulated aerial combat maneuers (ACM), which consisted of 15 s period of 4.5 and 7 g until exhaustion, before and after 11 weeks of muscle strength training. It was found that the ACM time in 11 fighter pilots increased after muscle strenth training by 39 percent. In adition, gains were found in knee extensor muscle strength during slow contraction by 17 percent and in anaerobic power by 14 percent. No changes were observed in the aerobic performance and various muscle histochemical indices, as assessed from muscle biopsy samples obtained from m. vastus lateralis. It is suggested that neuromuscular adaptation was responsible for

the increased muscle strength, as well as for the improved performance of the M-1 straining maneuver, which might explain the enhanced g tolerance.

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83A41140 ISSUE 19 PAGE 2880 CATEGORY 52 ISSN 0161-7567 83/07/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Power output and fatigue of human muscle in maximal cycling exercise

AUTHORS: A/Mccartney, N.; B/Heigenhauser, J. F.; C/Jones, N. L. ***PAA***: C/(McMaster University, Hamilton, Ontario, Canada)

CIO: Canada-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology (ISSN 0161-7567), Vol. 55, July 1983, P. 218-224. Research Supported By The Ontario Heart Foundation And Medical Research Council Of Canada.,

MAJS: /*Exercise Physiology/*Fatigue (Biology)/*Muscular Strength/*Work Capacity

MINS: / Body Volume (Biology)/ Ergometers/ Lactates/ Physical Exercise/ Torque

ABA: T.K.

ABSTRACT: The relationships of maximum torque and fatigue to crank velocity were investigated in 13 male subjects using a constant-velocity cycle ergometer in 30-sec maximal-exercise tests. The thigh-muscle volume of the subjects was determined by tomography and plasma lactate concentration 3 min after the test was measured by a fluorometric enzymatic method. Tests were performed at 60, 80, 100, 120, 140, and 160 rpm. Maximum torque is found to vary directly with velocity and with thigh-muscle volume, while peak power varies parabolically with velocity and was achieved at different velocities in different subjects. Comparison of peak and average power output at 60, 100, and 140 rpm reveals that the higher peak values obtained at the higher velocities in the first 3 sec of the trials are compensated by more rapid fatigue, so that average-power values over the 30-sec test, like the plasma-lactate and work values, were not significantly different at the three velocities. Preliminary results from needle biopsies of muscle tissue indicate that individual differences in short versus long-term performance are related to the proportion of type-II fibers in the thigh muscle.

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83A34949 ISSUE 15 PAGE 2213 CATEGORY 52 ISSN 0040-3601 82/12/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: A study of the strength and endurance of individual groups of muscles using a polyergocorpographic device

UFTL: Issledovanie sily i vynoslivosti otdel'nykh grupp myshts s pomoshch'iu poliergokorpograficheskoi ustanovki

AUTHORS: A/Buriakin, F. G.; B/Kesedzhian, M. A. ***PAA***: B/(Armianskii Gosudarstvennyi Institut Fizicheskoi Kul'tury, Armenian SSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), Dec. 1982, P. 20-22. In Russian.,

MAJS: /*Biotelemetry/*Muscular Function/*Stress (Physiology)/*Systems Engineering

MINS: / Aerospace Medicine/ Ergometers/ Exercise Physiology/ Muscular Strength

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83A33304 ISSUE 14 PAGE 2070 CATEGORY 52 ISSN 0040-3601 82/11/00 4 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: An evaluation of muscle forces according to the electrical activity of muscles during athletic exercises in 'loadless' conditions
UFTL: Otsenka myshechnykh usilii po elektricheskoi aktivnosti myshts pri vypolnenii sportivnykh uprazhnenii v 'beznagruzochnykh' usloviiakh
AUTHORS: A/Kovalik, A. V. ***PAA***: A/(Penzenskii Zavod-VTUZ, Penza, USSR)
CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), Nov. 1982, P. 26-29. In Russian.,
MAJS: /*Exercise Physiology/*Muscular Function/*Muscular Strength/*Myoelectric Potentials
MINS: / Electromyography/ Joints (Anatomy)/ Musculoskeletal System

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83A22778 ISSUE 8 PAGE 1146 CATEGORY 52 83/02/00 5 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: The characteristics of the CO2 balance during physical loads in healthy untrained individuals
UFTL: Ob osobennostiakh balansa CO2 pri fizicheskoi nagruzke u zdorovykh netrenirovannykh liudei
AUTHORS: A/Khanlarova, T. A.
CIO: Unknown-- Fiziologiia Cheloveka, Vol. 9, Jan.-Feb. 1983, P. 103-107. In Russian.,
MAJS: /*Acid Base Equilibrium/*Carbon Dioxide Tension/*Physical Exercise/* Physiological Effects/*Stress (Physiology)
MINS: / Aerospace Medicine/ Health/ Homeostasis

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83A20782 ISSUE 7 PAGE 977 CATEGORY 52 83/02/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Effects of travel across time zones /jet-lag/ on exercise capacity and performance
AUTHORS: A/Wright, J. E.; B/Vogel, J. A.; C/Sampson, J. B.; D/Knapik, J. J.; E/Patton, J. F.; F/Daniels, W. L. ***PAA***: F/(U.S. Army, Research Institute of Environmental Medicine, Natick, MA)
CIO: United States-- Aviation, Space, And Environmental Medicine, Vol. 54, Feb. 1983, P. 132-137.,
MAJS: /*Human Performance/*Jet Lag/*Physical Exercise/*Work Capacity
MINS: / Muscular Strength/ Performance Tests/ Respiratory Physiology
ABA: C.R.
ABSTRACT: Eighty-one healthy male soldiers, aged 18-34, are investigated for 5 days before and 5 days after an eastward deployment across six time zones to determine the effects of translocation on exercise capacity and performance. Fatigue, weakness, headache, sleepiness, irritability, and other commonly reported symptoms are found to occur in the majority of subjects. Most, but not all, of the symptoms, are diminished or gone by the fifth day after the translocation. Cardiorespiratory function and perception of effort during both submaximal and maximal treadmill exercise are unaffected. The isometric strength of the upper torso, legs, and trunk extensor muscles is also not changed. The dynamic strength and endurance of elbow flexors are found to decline significantly. Dynamic knee extensor strength and endurance cores show a progressive decline before translocation and are inconsistent, suggesting that the stress of repetitive testing outweighs any jet-lag effects on performance capacity.

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83A17152 ISSUE 5 PAGE 672 CATEGORY 52 82/10/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The effect of dangerous motions on kinesthesia

UFTL: Vliianie opasnykh dvizhenii na myshechnoe chuvstvo

AUTHORS: A/Kalashnikov, G. A. ***PAA***: A/(Chernigovskii Pedagogicheskii Institut, Chernigov, Ukrainian SSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, Oct. 1982, P. 14-16. In Russian.,

MAJS: /*Hazards/*Kinesthesia/*Muscular Strength/*Physical Exercise/* Psychophysiology/*Sensorimotor Performance

MINS: / Aerospace Medicine/ Auditory Stimuli/ Loudness/ Physiological Effects/ Psychological Effects/ Stress (Physiology)/ Stress (Psychology)

ABA: V.L.

ABSTRACT: Experiments are reported in which the subjects were asked to perform various types of physical exercise involving elements of danger (e.g., jumps while on a balance beam) or surprise (e.g., unexpected loud sounds), and their motor reactions were monitored using simple techniques. It is found that such exercise produces protective reactions resulting in reduced motion amplitude and muscular strength. Based on the data obtained, it is recommended that the element of danger be increased gradually during training to permit the athlete to develop the required motor skills.

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83A15410 ISSUE 4 PAGE 525 CATEGORY 54 82/00/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Manual parachute ripcord pull-force capability of female naval personnel

AUTHORS: A/Pheeny, H. T.; B/Lamora, G. F.; C/Gilbert, J. H.; D/Vollmer, G. F. ***PAA***: B/(U.S. Naval Weapons Center, China Lake, CA)

CIO: United States-- ***In***: SAFE Association, Annual Symposium, 19th, Las Vegas, NV, December 6-10, 1981, Proceedings. (A83-15401 04-54) Van Nuys, CA, SAFE Association, 1982, p. 42-48.,

MAJS: /*Females/*Flight Crews/*Manual Control/*Muscular Strength/*Parachute Descent/*Physiological Tests

MINS: / Free Fall/ Human Factors Engineering/ Navy/ Personnel Selection/ Physical Factors/ Pulling

ABA: C.D.

ABSTRACT: The results are presented of a preliminary study to determine whether female military personnel, selected to meet the anthropometric and physical criteria for aircrew status, could manually exert a ripcord pull-force of at least 27 pounds on both NB-7 and NB-8 parachute assemblies. In static ground tests the 16 female test subjects were suspended in an attitude analogous to freefall and instructed to exert maximum pull-forces with right, left, and both hands on parachute ripcord assemblies. Female test parachutists then performed the same operations in live jump tests. Preliminary results show that women lack sufficient strength to consistently deploy the parachute assemblies. It is recommended that aircrew selection and annual physical qualification procedures should include a static muscular strength test, and that a muscular strength training program be required for all aircrew members.

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83A11139 ISSUE 1 PAGE 83 CATEGORY 52 ***CNT#***: NIH-1-R01-HL-25977-01 82/00/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: A comparison of the cardiovascular responses to isometric exercise of three different sized muscle groups

AUTHORS: A/Hendershot, D. M.; B/Petrofsky, J. S.; C/Reynolds, D. B.; D/Glaser, R. M. ***PAA***: D/(Wright State University, Dayton, OH)

CIO: United States-- ***In***: NAECON 1982; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 18-20, 1982. Volume 1. (A83-11083 01-01) New York, Institute of Electrical and Electronics Engineers, Inc., 1982, p. 457-563.,

MAJS: /*Blood Pressure/*Cardiovascular System/*Exercise Physiology/*Heart Rate/* Hemodynamic Responses/*Muscular Fatigue

MINS: / Muscular Strength/ Musculoskeletal System/ Weight (Mass)

ABA: (Author)

ABSTRACT: Blood pressure and heart rate responses were determined during fatiguing isometric contractions of the handgrip, adductor pollicis and quadriceps muscles in 3 college age subjects at tensions of 25, 40 and 70% maximum voluntary contraction (MVC) with the circulation free and occluded. The results show the maximum heart rate recorded at the end of exercise to be directly related to the tension exerted during the contraction. However, the blood pressure response was independent of the tension exerted by any muscle group. The pressure and heart rate responses were found to be identical when compared between large muscle groups while the pressure response was reduced for the smaller muscle groups. It therefore appears that different muscles show different cardiovascular responses to isometric exercise.

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83A10523 ISSUE 1 PAGE 83 CATEGORY 52 82/07/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The active and passive flexibility of athletes of various specialties

UFTL: Aktivnaia i passivnaia gibkost' u sportsmenov razlichnykh spetsializatsii

AUTHORS: A/Iashvili, A. V. ***PAA***: A/(Goriiskii Gosudarstvennyi Pedagogicheskii Institut, Gori, Georgian SSR; Gosudarstvennyi Institut Fizicheskoi Kul'tury, Leningrad, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, July 1982, P. 51, 52. In Russian.,

MAJS: /*Athletes/*Exercise Physiology/*Joints (Anatomy)/*Muscular Function

MINS: / Flexibility/ Musculoskeletal System

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83A10520 ISSUE 1 PAGE 83 CATEGORY 52 82/07/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The content of glycogen in muscles and the effect of the carbohydrate saturation method on the physical aerobic work capacity of athletes and nonathletes

UFTL: Soderzhanie glikogena v myshtsakh i vliianie metoda uglevodnogo nasychsheniia /MUN/ na fizicheskuii aerobnuiu rabotosposobnost' sportsmenov i nesportsmenov

AUTHORS: A/Kots, Ia. M.; B/Alikhanova, L. I.; C/Vinogradova, O. L.; D/Gorodetskii, V. D. ***PAA***: D/(Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Leningrad, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, July 1982, P. 21-23. In Russian.,

MAJS: /*Athletes/*Glycogens/*Muscular Strength/*Physical Work/*Physiological Effects/*Work Capacity
MINS: / Aerospace Medicine/ Physical Exercise/ Saturation (Chemistry)

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82A41213 ISSUE 20 PAGE 3239 CATEGORY 52 82/08/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Neuromuscular adaptation in human thenar muscles following strength training and immobilization
AUTHORS: A/Sale, D. G.; B/Mccomas, A. J.; C/Macdougall, J. D.; D/Upton, A. R. M. ***PAA***: D/(McMaster University, Hamilton, Ontario, Canada)
CIO: Canada-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology, Vol. 53, Aug. 1982, P. 419-424. Research Supported By The Muscular Dystrophy Association Of Canada.,
MAJS: /*Immobilization/*Muscular Strength/*Neuromuscular Transmission/*Physical Exercise/*Physiological Effects
MINS: / Adaptation/ Aerospace Medicine/ Conditioned Reflexes/ Muscular Function
ABA: (Author)
ABSTRACT: The effects of strength training and limb immobilization on the human thenar muscles were investigated in 11 healthy subjects. One group (n = 6) trained prior to immobilization and a second group (n = 5) underwent immobilization prior to training. Measurements made in the control condition and following the two experimental conditions included voluntary isometric strength, motor-unit counts, motor nerve conduction velocity, reflex potentiation, and isometric twitch-contraction properties. When the results of both groups were combined an average of 5 wk of immobilization was found to cause a significant decrease in voluntary strength (42%, P less than 0.05) and reflex potentiation (37%, P less than 0.01) in relation to the control condition. Training caused an increase (40%, P less 0.05) in voluntary strength and a decrease in twitch tension (25%, p less than 0.01) and contraction time (8%, P less than 0.05). Training prior to immobilization provided a reserve of neuromuscular function, which attenuated the effect of immobilization in relation to the control condition. It was concluded that neural as well as muscular adaptation occurred in response to immobilization.

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82A40662# ISSUE 20 PAGE 3236 CATEGORY 52 82/00/00 2 PAGES UNCLASSIFIED DOCUMENT
TITLE: Cardiovascular responses to isometric exercise during simulated zero gravity
AUTHORS: A/Bonde-Petersen, F.; B/Suzuki, Y.; C/Sadamoto, T. ***PAA***: C/(Copenhagen, University, Copenhagen, Denmark)
CIO: Denmark-- Physiologist, Supplement, Vol. 22, Dec. 1979 (1982), P. S-37, S-38.,
MAJS: /*Cardiovascular System/*Hemodynamic Responses/*Microgravity/*Muscular Function/*Physical Exercise/*Weightlessness Simulation
MINS: / Aerospace Medicine/ Body Weight/ Contraction/ Heart Rate/ Males/ Muscular Strength/ Sitting Position/ Supine Position
ABA: B.J.
ABSTRACT: Experiments were performed on six healthy males (age 21-35 years) in order to investigate whether blood pressure reflexes during isometric exercise are related to relative

muscle strength applied, and whether these reflexes are influenced by simulated weightlessness (the supine position). It is shown that knee extension has the greatest impact on cardiovascular parameters; in addition, the cardiac output showed its greatest increase to above 10 l/min during contraction. Contrary to the results of Lind et al. (1964), responses to isometric exercise at 40% MVC (maximal voluntary contraction) are found to depend on the muscle mass involved.

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82A40649 ISSUE 20 PAGE 3223 CATEGORY 51 82/00/00 88 PAGES UNCLASSIFIED DOCUMENT

TITLE: Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book

CIO: Unknown-- Physiologist, Supplement, Vol. 22, Dec. 1979 (1982). 88 P. (For Individual Items See A82-40650 To A82-40685),

MAJS: /*Acceleration Stresses (Physiology)/*Aerospace Medicine/*Bioastronautics /*Conferences/*Gravitational Effects/*Physiological Acceleration

MINS: / Biological Models (Mathematics)/ Computerized Simulation/ Electrolyte Metabolism/ Geotropism/ Hemodynamic Responses/ High Temperature Environments/ Hypodynamia/ Muscular Strength/ Orthostatic Tolerance/ Physical Exercise/ Physiological Effects/ Physiological Tests/ Plant Stress/ Space Flight Stress/ Vegetation Growth/ Weightlessness Simulation

ABA: B.J.

ABSTRACT: Topics discussed include procedural approaches to gravitational physiology, methodological aspects of future cardiovascular research in space, and low-G simulation in mammalian research. Particular papers are presented on a rat model for the simulation of certain aspects of space flight, cardiovascular responses to isometric exercise during simulated zero gravity, the morphogenesis of a higher plant from cultured cells and embryos in space, and centrifuge high-g effects on temperature regulation in unanesthetized rats. Also considered are the effect of baroreceptor denervation on +Gz tolerance in dogs, the dynamics of weight loss during prolonged space flight, and the effects of horizontal hypokinesia on performance and circadian physiological rhythms in female humans.

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82A40451 ISSUE 20 PAGE 3220 CATEGORY 51 82/06/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The effect of inotropic factors on the postexercise characteristics of the heart

UFTL: Vliianie inotropnykh faktorov na postnagruzochnye kharakteristiki serdtsa

AUTHORS: A/Orlova, Ts. R.; B/Ragimov, S. E.; C/Shlain, V. A.; D/Sakharov, M. P.; E/Trubetskoi, A. V. ***PAA***: E/(Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR)

CIO: Ussr-- Biulleten' Eksperimental'noi Biologii I Meditsiny, Vol. 93, June 1982, P. 5-7. In Russian.,

MAJS: /*Cardiac Ventricles/*Heart Function/*Hemodynamic Responses/*Muscular Strength/*Physical Exercise

MINS: / Blood Flow/ Blood Pressure/ Calcium Chlorides/ Cats/ Epinephrine/ Flow Velocity/ Obsidian/ Stress (Physiology)

ABA: B.J.

ABSTRACT: Acute experiments performed on cats show that the postexercise characteristics of the left ventricle plotted as a relationship between the magnitudes of the maximal blood flow velocity and systolic intraventricular pressure in normal cases and in cases of inotropic exposure are close to the linear ones. Adrenaline shifts the postexercise characteristics upward and to the right, increasing both the maximal magnitude of the blood flow velocity at zero pressure and the maximal magnitude of the pressure at zero blood flow. Calcium chloride and obsidian produce a parallel shift of the postexercise characteristics

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82A38568 ISSUE 19 PAGE 3087 CATEGORY 52 82/05/00 4 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions

UFTL: Vliianie nekotorykh kharakteristic rabochikh dvizhenii na vynoslivost' myshts ruk k staticheskomu usiliiu

AUTHORS: A/Kokhanova, N. A.; B/Shardakova, E. F.; C/Elizarova, V. V.; D/Kolosova, F. A. ***PAA***: D/(Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR)

CIO: Ussr-- Gigiena Truda I Professional'nye Zabolevaniia, May 1982, P. 15-18. In Russian.,

MAJS: /*Hand (Anatomy)/*Human Tolerances/*Muscular Fatigue/*Physical Work/* Physiological Tests/*Static Loads

MINS: / Females/ Motion/ Muscular Strength

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82A37929 ISSUE 18 PAGE 2921 CATEGORY 52 82/07/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Muscle weakness following dynamic exercise in humans

AUTHORS: A/Davies, C. T. M.; B/White, M. J. ***PAA***: B/(Queen's Medical Centre, Nottingham, England)

CIO: United Kingdom-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology, Vol. 53, July 1982, P. 236-241.,

MAJS: /*Electric Stimuli/*Muscular Fatigue/*Muscular Function/*Muscular Strength /*Physical Exercise/*Stress (Physiology)

MINS: / Contraction/ Muscular Tonus/ Physiological Effects/ Running/ Time Dependence/ Twitching

ABA: A.L.W.

ABSTRACT: The effects of dynamic exercise on muscular force generation in response to electrical stimulation are investigated in subjects performing 1 hour of level running and uphill walking at a gradient of 25% on a treadmill, and box stepping on and off a 0.5-m platform. Tension development was measured during both submaximal and supramaximal twitch and tetanic stimulation of the triceps surae before and after exercise. At submaximal stimulation voltages, running and walking are found to enhance twitch and tetanic responses, however the supramaximal time to peak tension, twitch tension and tetanic tensions were reduced, with the reduction in tetanus at 100 Hz associated with a decrease in maximal voluntary contraction. Muscular functions were found to return to normal 2 hours after running and walking, in contrast to box-stepping, which produced a more pronounced weakening which lasted at least 22 hours. Results illustrate the difficulties in using submaximal stimulation voltages and tetanic response ratios in studies of muscle function,

and suggest that long-lasting muscle weakness is not associated with recovery from prolonged running or walking.

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82A27804 ISSUE 12 PAGE 1959 CATEGORY 52 82/01/00 4 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Comprehensive evaluation of the human functional state using ergometry

UFTL: Kompleksnaia otsenka funktsional'nogo sostoianiia cheloveka pri ergometricheskikh issledovaniiakh

AUTHORS: A/Buzunov, V. A.; B/Kalnish, V. V. ***PAA***: B/(Ministerstvo Zdravookhraneniia Ukrainskoi SSR, Institut Gigieny Truda i Profzabolevanii, Kiev, Ukrainian SSR)

CIO: Ussr-- Gigiena I Sanitariia, Jan. 1982, P. 51-54. In Russian.,

MAJS: /*Biometrics/*Ergometers/*Human Performance/*Physiological Effects/*Stress (Physiology)

MINS: / Hemodynamic Responses/ Mean/ Physical Exercise/ Respiration/ Variance (Statistics)/ Work Capacity

ABA: B.J.

ABSTRACT: The paper proposes a method for calculating integral statistical characteristics (the arithmetical mean and the variance) of a set of dimensionless quantities characterizing the human functional state. Results of ergometric studies are presented for healthy and practically healthy persons 20 to 60 years old with reference to a set of physiological indices, including respiration and hemodynamics.

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82A27780 ISSUE 12 PAGE 1958 CATEGORY 52 82/01/00 6 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: A model of the dynamics of athlete condition during the yearly cycle and its role in the management of training

UFTL: Model' dinamiki sostoianiia sportsmena v godichnom tsikle i ee rol' v upravlenii trenirovochnym protsessom

AUTHORS: A/Verkhoshanskii, Iu. V.; B/Mironenko, I. N.; C/Antonova, T. M.; D/Khachatrian, O. V.; E/Nikitin, S. V.; F/Levchenko, A. V. ***PAA***: F/(Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, Jan. 1982, P. 14-19. In Russian.,

MAJS: /*Athletes/*Biodynamics/*Exercise Physiology/*Physical Fitness

MINS: / Dynamic Response/ Leg (Anatomy)/ Long Term Effects/ Muscular Strength

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82A24488 ISSUE 10 PAGE 1648 CATEGORY 52 81/06/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Energy supply characteristics and blood protein and electrolyte content during submaximal muscular activity in bicyclists

UFTL: Pokazateli energoobespecheniia, belkovogo i elektrolitnogo sostava krovi pri myshechnoi rabote submaksimal'noi moshchnosti u velosipedistov

AUTHORS: A/Efimenko, A. M.; B/Tolkacheva, N. V.; C/Shiriaev, V. V.; D/Taranets, A. G.; E/Verbitskii, O. N. ***PAA***: E/(Simferopol'skii Gosudarstvennyi Universitet, Simferopol, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, June 1981, P. 23, 24. In Russian.,
MAJS: /*Blood/*Electrolyte Metabolism/*Exercise Physiology/*Muscular Strength/* Protein Metabolism
MINS: / Acid Base Equilibrium/ Bicycle/ Carbohydrate Metabolism/ Enzyme Activity / Lactic Acid/ Running

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82A24479 ISSUE 10 PAGE 1647 CATEGORY 52 81/10/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Regulation of blood supply in the extremities during exercise in women
UFTL: Reguliatsiia krovosnabzheniia konechnostei pri fizicheskoi nagruzke u zhenshchin
AUTHORS: A/Ozolin, P. P.; B/Plismane, S. O.; C/Strelis, K. E. ***PAA***: C/(Latviiski Nauchno-Issledovatel'skii Institut Eksperimental'noi i Klinicheskoi Meditsiny; Gosudarstvennyi Politekhnicheskii Institut, Riga, Latvian SSR)
CIO: Latvia-- Teoriia I Praktika Fizicheskoi Kul'tury, Oct. 1981, P. 27-29. In Russian.,
MAJS: /*Blood Flow/*Females/*Muscular Strength/*Physical Work/*Physiological Tests/*Regulatory Mechanisms (Biology)
MINS: / Appendages/ Athletes/ Blood Volume/ Sex Factor
ABA: A.L.W.
ABSTRACT: Changes in blood supply to the extremities with the process of adaptation to physical training are investigated in female athletes. Blood flow in the forearm and calf and arterial pressure were monitored in untrained female students and female athletes before, during and after bicycle ergometer exercise. Data reveal a close agreement between cardiac function and volume blood flow rate in the working and nonworking extremities during rest and submaximal exercises, indicative of regulation by the same mechanism, most likely sympathetic activation. Such a mechanism, occurring to a greater extent in women than in men and acting to induce vascular contraction in both working and nonworking muscles, may explain the observed reduction in the work capacities and endurance of women with respect to men.

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82A23285 ISSUE 9 PAGE 1426 CATEGORY 52 81/07/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: The physiological condition of press operators
UFTL: Sostoianie fiziologicheskikh funktsii u rabochikh-shtampovshchikov
AUTHORS: A/Ratsenberg, B. M.; B/Severova, N. G.
CIO: Unknown-- Gigiena Truda I Professional'nye Zabolevaniia, July 1981, P. 57-59. In Russian.,
MAJS: /*Human Factors Engineering/*Hypokinesia/*Monotony/*Operator Performance/* Physical Work/*Physiological Effects
MINS: / Blood Pressure/ Critical Flicker Fusion/ Heart Rate/ Illuminating/ Muscular Fatigue/ Muscular Strength/ Noise Reduction/ Physical Exercise/ Reaction Time/ Sensorimotor Performance
ABA: A.L.W.
ABSTRACT: Results are presented of a study of the physiological functions of workers performing light manual labor characterized by monotony and the necessity of sitting for long periods of time. Press operators were evaluated for heart rate, arterial pressure, visual-

motor reaction time, critical flicker fusion and muscular endurance six times during the course of a work shift. The indicators followed are observed to undergo significant variations during the course of work, most notably a slowing of the pulse attributed to monotony, a decrease in critical flicker fusion frequency and increase in reaction time indicating stress on visual-motor functions and a decrease in central nervous system lability, and a decrease in muscle strength indicative of fatigue. Physiological conditions are found to be improved, however, following the institution of improvements in working conditions, including noise reduction, increased illumination, and three additional rest periods, during two of which physical exercises were performed.

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82A23284 ISSUE 9 PAGE 1426 CATEGORY 52 81/10/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The influence of physical stress on the dynamics of work capacity and electrical activity of skeletal muscles in the course of an entire day

UFTL: Vliianie fizicheskoi nagruzki na dinamiku rabotosposobnosti i elektricheskoi aktivnosti skeletnykh myshts na protiazhenii dnia

AUTHORS: A/Shcherbina, Iu. V. ***PAA***: A/(Kievskii Meditsinskii Institut, Kiev, Ukrainian SSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, Oct. 1981, P. 29, 30. In Russian.,

MAJS: /*Bioelectricity/*Diurnal Variations/*Musculoskeletal System/* Physiological Effects/*Stress (Physiology)/*Work Capacity

MINS: / Dynamometers/ Electromyography/ Muscular Strength/ Physical Exercise

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82A23282 ISSUE 9 PAGE 1426 CATEGORY 52 81/02/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Control of the number of discharges of individual motor units in skeletal muscles as a test of coordination in athletes

UFTL: Upravlenie chislom razriadov otdel'nykh dvigatel'nykh edinits skeletnykh myshts kak test dlia vyiavleniia koordinatsionnykh sposobnostei sportsmenov

AUTHORS: A/Gorodnichev, R. M.; B/Diubin, V. V.; C/Spirin, V. K.; D/Shapkov, Iu. T. ***PAA***: D/(Moskovskii Oblastnoi Gosudarstvennyi Institut Fizicheskoi Kul'tury, Velikiye Luki; Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, Feb. 1981, P. 26-28. In Russian.,

MAJS: /*Athletes/*Coordination/*Efferent Nervous Systems/*Muscular Function/* Musculoskeletal System/*Neuromuscular Transmission/*Physiological Tests

MINS: / Muscular Strength/ Physical Exercise

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82A21818 ISSUE 8 PAGE 1270 CATEGORY 52 81/08/00 3 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Rationalizing physical regimen of sedentary workers

UFTL: Obosnovanie ratsional'nogo dvigatel'nogo rezhima liuder umstvennogo truda

AUTHORS: A/Mitrokhina, V. V. ***PAA***: A/(Moskovskii Tekhnologicheskii Institut Bytovogo Obsluzhivaniia Naseleniia RSFSR, Moscow, USSR)

CIO: Ussr-- Teoriia I Praktika Fizicheskoi Kul'tury, Aug. 1981, P. 32-34. In Russian.,

MAJS: /*Education/*Hypokinesia/*Mental Performance/*Physical Exercise

MINS: / Age Factor/ Females/ Health/ Muscular Function/ Physiological Effects/ Productivity

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82A21805 ISSUE 8 PAGE 1269 CATEGORY 52 81/00/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Physical health of truck drivers in the open-pit mining industry of the far north

UFTL: Sostoianie zdorov'ia voditelei avtotransporta kar'erov dobyvaiushchei promyshlennosti Krainego Severa

AUTHORS: A/German, G. N. ***PAA***: A/(Iakutskii Gosudarstvennyi Universitet, Yakutsk, USSR)

CIO: Ussr-- Zdravookhranenie Rossiiskoi Federatsii, No. 9, 1981, P. 14, 15. In Russian.,

MAJS: /*Health/*Mines (Excavations)/*Operator Performance/*Physical Fitness/* Work Capacity

MINS: / Age Factor/ Human Pathology/ Males/ Prophylaxis/ Trucks/ Vitamins/ Winter

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82A21678 ISSUE 8 PAGE 1267 CATEGORY 52 82/02/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The effect of two years' training of aerobic power and muscle strength in male and female cadets

AUTHORS: A/Daniels, W. L.; B/Wright, J. E.; C/Sharp, D. S.; D/Kowal, D. M.; E/Mello, R. P.; F/Stauffer, R. S. ***PAA***: F/(U.S. Army, Research Institute of Environmental Medicine, Natick, MA; U.S. Military Academy, West Point, NY)

CIO: United States-- Aviation, Space, And Environmental Medicine, Vol. 53, Feb. 1982, P. 117-121.,

MAJS: /*Muscular Strength/*Oxygen Consumption/*Physical Exercise/*Physical Fitness/*Sex Factor/*Students

MINS: / Armed Forces (United States)/ Females/ Males/ Physiological Tests

ABA: G.R.

ABSTRACT: The considered investigation is concerned with a comparison of the responses of male and female cadets to extended military training at the U.S. Military Academy. During the course of the study, the training program of both male and female cadets was similar and, in some respects, identical. Volunteer cadets, 11 males and 7 females, completed all phases of this study. On all strength measures, the values for female cadets averaged approximately 30-40% lower than for males. The female cadets did not significantly narrow the gap with male cadets in terms of muscle strength and aerobic power, even after 2 years of similar training. These results indicate that post-pubertal females are unable to reduce the difference between themselves and males, even after extended training in a situation where many social, cultural, and environmental factors are very similar.

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82A20334 ISSUE 7 PAGE 1101 CATEGORY 51 81/09/00 5 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Bioenergetic characteristics of various kinds of physical loads

UFTL: Bioenergeticheskaia kharakteristika fizicheskikh nagruzok razlichnogo kharaktera

AUTHORS: A/Usik, S. V.; B/Lenkova, R. I. ***PAA***: B/(Leningradskii Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Leningrad, USSR)

CIO: Ussr-- Fiziologicheskii Zhurnal SSSR, Vol. 67, Sept. 1981, P. 1370-1374. In Russian.,

MAJS: /*Biochemistry/*Biophysics/*Energy Transfer/*Muscular Strength/*Physical Exercise
MINS: / Adaptation/ Aerobes/ Energy Sources/ Hydrocarbons/ Rats
ABA: B.J.
ABSTRACT: Bioenergetic characteristics of physical loads of various intensities and durations were obtained from experiments on adult white rats. These characteristics were used to classify the loads with respect to the character of the energy maintaining muscle activity and the use of hydrocarbon and nonhydrocarbon sources of energy. This approach can be used to evaluate the character and degree of adaptation of animals subjected to various types of loads.

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82A16945 ISSUE 5 PAGE 742 CATEGORY 52 81/10/00 14 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Pathophysiology of motor functions in prolonged manned space flights
AUTHORS: A/Kozlovskaia, I. B.; B/Kreidich, Iu. V.; C/Oganov, V. S.; D/Koserenko, O. P.
PAA: D/(Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR)
CIO: Ussr-- (International Academy Of Astronautics, International Symposium On Basic Environmental Problems Of Man In Space, 6th, Bonn, West Germany, Nov. 3-6, 1980.) Acta Astronautica, Vol. 8, Sept.-Oct. 1981, P. 1059-1072.,
MAJS: /*Bioastronautics/*Efferent Nervous Systems/*Long Duration Space Flight/* Muscular Strength/*Sensorimotor Performance/*Weightlessness
MINS: / Electromyography/ Exercise Physiology/ Exobiology/ Muscular Tonus/ Physiological Effects/ Reflexes
ABA: (Author)
ABSTRACT: The influence of weightlessness on different parts of the motor system has been studied in crew members of 140- and 175-day space flights. It has been shown that weightlessness affects all parts of the motor system including: (1) the leg and trunk muscles, in which severe atonia, a decrease of strength and an increase of electromyographic cost of contraction have been observed; (2) the proprioceptive elements and the spinal reflex mechanisms in which decreased thresholds accompanied by decreases of maximal amplitude of reflexes and disturbances in cross reflex mechanisms have been found; and (3) the central mechanisms that control characteristics of postural and locomotor activities. The intensities and durations of disturbances of different parts of the motor system did not correlate to each other, but did correlate with prophylactic activity during space flight. The data suggest a different nature of disturbances caused by weightlessness in different parts of the motor system.

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82A15712 ISSUE 4 PAGE 584 CATEGORY 52 81/08/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Management by means of muscular activity under unloaded conditions
UFTL: Upravlenie aktivnost'iu myshts v 'beznagruzochnykh' usloviiakh
AUTHORS: A/Kovalik, A. V. ***PAA***: A/(Penzenskii Politekhnicheskii Institut, Penza, USSR)
CIO: Ussr-- Gigiena Truda I Professional'nye Zabolevaniia, Aug. 1981, P. 44, 45. In Russian.,
MAJS: /*Hypodynamia/*Muscular Function/*Physical Exercise

MINS: / Aerospace Medicine/ Bioelectricity/ Hypokinesia/ Loads (Forces)/ Muscular Strength/ Physiological Effects/ Prophylaxis
ABA: A.L.W.
ABSTRACT: The potential of selective muscular activity in the absence of any external burden for the prevention of hypodynamia is assessed. In a first series of experiments, the possibility of voluntarily effecting maximum exercise of various muscles was confirmed by measurements of muscle force and bioelectrical activity, although in most cases the magnitude of the exercise was less in the unloaded state than when overcoming some external burden, and various muscle groups showed more controllability than others. Measurements of the durations possible for alternating muscle exercise in the unloaded state have shown them to range up to 3 hours. The possibility of effecting muscular exercise under unloaded conditions thus allows the development of a training program aimed at improving muscular sense and elevating muscular activity at any time and under any conditions, and permits management by muscular function, guided only by muscular sense.

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81A47388 ISSUE 23 PAGE 4080 CATEGORY 52 ***RPT#***: IAF PAPER 81-170 81/09/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Simple technique to evaluate on the ground the energetic expenditure of physical exercise carried out in weightlessness
AUTHORS: A/Scano, A. ***PAA***: A/(Istituto Superiore di Educazione Fisica; Roma, Universita, Rome, Italy)
CIO: Italy-- International Astronautical Federation, International Astronautical Congress, 32nd, Rome, Italy, Sept. 6-12, 1981, 6 P.,
MAJS: /*Astronaut Performance/*Ergometers/*Physical Exercise/*Physiological Tests/*Weightlessness
MINS: / Acceleration Tolerance/ Muscular Strength/ Space Commercialization/ Space Flight
ABA: (Author)
ABSTRACT: A simple method is described to evaluate the energetic expenditure of graded muscular exercises carried out on the ground in such a way as to approximate the state of space microgravity. The consumption of O2 measured at different rates of execution is shown as well as a tentative computation of the mechanical work on the basis of the accelerations impressed alternately on the mass of the trunk and upper limbs. The practicability of the method proposed under space conditions is pointed out; it does not require any ergometer, in fact, but only the fixing of the subject's feet to the floor of the vehicle.

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81A12253 ISSUE 2 PAGE 215 CATEGORY 52 80/07/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: The specificity of endurance training on muscular power and muscle fibre size
AUTHORS: A/Constable, S. H.; B/Collins, R. L.; C/Krahenbuhl, G. S. ***PAA***: A/(Arizona, University, Tucson, Ariz.); C/(Arizona State University, Tempe, Ariz.)
CIO: United States-- Ergonomics, Vol. 23, July 1980, P. 667-678.,
MAJS: /*Cardiovascular System/*Exercise Physiology/*Muscular Strength/*Physical Fitness/*Physiological Responses/*Physiological Tests
MINS: / Durability/ Females/ Leg (Anatomy)/ Oxygen Tension/ Running/ Twitching

ABA: A.T.

ABSTRACT: The specificity of endurance training concepts was examined by training 6 female students in 30 min of continuous running 3 times/wk for 12 weeks. Tests including measurements of muscular leg power and cardiovascular endurance were made; a muscle biopsy from the lateral aspect of the gastrocnemius muscle was also performed. The training produced important changes in the exercising of subjects for the 12-min run; no changes were found in the tests of muscular power of individual fiber areas.

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80A32846# ISSUE 13 PAGE 2420 CATEGORY 52 79/00/00 192 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT

TITLE: Assessment of physical working capacity in clinic and athletics --- Russian book

UFTL: Opredelenie fizicheskoi rabotosposobnosti v klinike i sporte

AUTHORS: A/Aulik, I. V.

CIO: Unknown-- Moscow, Izdatel'stvo Meditsina, 1979. 192 P. In Russian.,

MAJS: /*Athletes/*Clinical Medicine/*Health/*Physical Exercise/*Physical Work/* Physiological Tests/*Work Capacity

MINS: / Children/ Hypokinesia/ Musculoskeletal System/ Patients/ Quantitative Analysis

ABA: S.D.

ABSTRACT: The monograph outlines methods of using graded physical exercises for the diagnosis of the status of practically healthy persons, patients, and athletes. The concepts of 'health' and 'physical working capacity' are discussed. The necessity of assessing the so-called dynamic health is stressed. An original method of quantitative evaluation of physical working capacity in clinic and athletics is proposed. A review of literature regarding the influence of hypokinesia on one's health condition is given. A methodology is presented for assessing selected indicators of physical working capacity. Attention is given to methods of evaluating the working capacity of children and juveniles, as well as patients and convalescents. Basic principles of maintaining and enhancing physical working capacity are briefly outlined. In particular, physiological essentials of motor tests are briefly described.

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79A50652# ISSUE 22 PAGE 4211 CATEGORY 52 79/08/00 11 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT

TITLE: Biomechanical properties of muscles and the efficiency of movement

UFTL: Biomekhanicheskie svoistva myshts i effektivnost' dvizheniia

AUTHORS: A/Aruin, A. S.; B/Prilutskii, B. I.; C/Raitsin, L. M.; D/Savelev, I. A. ***PAA***: D/(Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury; Moskovskii Institut Elektronnogo Mashinostroeniia, Moscow, USSR)

CIO: Ussr-- Fiziologiia Cheloveka, Vol. 5, July-Aug. 1979, P. 589-599. In Russian.,

MAJS: /*Biodynamics/*Muscular Strength/*Physiological Tests

MINS: / Efficiency/ Muscular Fatigue/ Physical Work

ABA: S.D.

ABSTRACT: Experiments are conducted on five well-trained male weight lifters (18-22 yr) to demonstrate an increase in the efficiency factor (ratio of mechanical work done to total energy expenditure) of muscular activity with increasing amplitude of movement and external load, as well as during transition from a negative movement phase to a positive one. Data are presented on the stored and expended energy of elastic deformation of

muscles during squatting exercises. Biomechanical properties of the muscles are found to be an important factor for increased efficiency of movement.

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79A43706 ISSUE 18 PAGE 3502 CATEGORY 52 79/07/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Effects of endurance training on left ventricular dimensions in healthy men

AUTHORS: A/Wolfe, L. A.; B/Cunningham, D. A.; C/Rechnitzer, P. A.; D/Nichol, P. M. ***PAA***: D/(Western Ontario, University; St. Joseph's Hospital, London, Canada)

CIO: Canada-- Journal Of Applied Physiology: Respiratory, Environmental And Exercise Physiology, Vol. 47, July 1979, P. 207-212. Research Supported By The Ontario Department Of Health.,

MAJS: /*Cardiac Ventricles/*Echocardiography/*Health/*Heart Function/*Physical Exercise/*Physical Fitness

MINS: / Growth/ Physiological Tests

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77A11409# ISSUE 1 PAGE 101 CATEGORY 52 76/06/00 6 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT

TITLE: State of the human motor system during exposure for many days to a nitrogen-oxygen environment at pressures of up to 5 atm

UFTL: O sostoianii dvigatel'nogo apparata cheloveka v period mnogosutochnogo prebyvaniia v azotno-kislovodnoi srede pri davlenii do 5 ata

AUTHORS: A/Boush, R. L.

CIO: Unknown-- Kosmicheskaia Biologiia I Aviakosmicheskaia Meditsina, Vol. 10, May-June 1976, P. 26-31. In Russian.,

MAJS: /*Human Performance/*Hyperbaric Chambers/*Muscular Function/*Physical Exercise/*Physiological Effects

MINS: / Adaptation/ Ergometers/ Gas Mixtures/ Muscular Strength/ Muscular Tonus/ Physiological Tests

ABA: (Author)

ABSTRACT: The state of the motor function of individuals exercizing on a bicycle ergometer in an altitude chamber containing a nitrogen-oxygen environment at 5.0 atm was studied. Maximum isometric force, precision of movement control and muscular tension, accuracy and velocity of movements were recorded. The maximum force, precision and velocity of movements varied phasically. The greatest changes were found on the 1st-3rd and 6th-7th days of the exposure. These parameters returned to the normal when the atmosphere pressure was reduced to 1.0 atm. During exercise at an elevated pressure, the muscular force, accuracy and velocity of movements decreased. During exercise at a normal pressure, similar changes were less distinct and consistent.

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76A28913* ISSUE 13 PAGE 2009 CATEGORY 52 76/04/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Crew health status and monitoring summary - The second manned Skylab mission

AUTHORS: A/Buchanan, P. ***PAA***: A/(NASA, Kennedy Space Center, Biomedical Office, Cape Canaveral, Fla.)

CORP: National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
CIO: United States-- Aviation, Space, And Environmental Medicine, Vol. 47, Apr. 1976, P. 413-418.,
MAJS: /*Aerospace Medicine/*Bioastronautics/*Biomedical Data/*Skylab 3/*Space Flight Stress
MINS: / Blood Pressure/ Data Processing/ Health/ Metabolism/ Physical Exercise/ Vectorcardiography
ABA: C.K.D.
ABSTRACT: The evaluation of available medical data to determine the health status of the Skylab 3 crew members is discussed. The utilization of raw data from medical experiments during the course of the mission as a source of near-real time criteria for monitoring crew health is described. The percentage change of selected metabolic parameters, including calorie intake, Na intake, K intake, urine output, water intake, and body weight, from their pre-flight values, vectorcardiographic data, and results of the lower body negative pressure experiment provided a core of information upon which clinical judgements could be made. Minor clinical problems occurring during the mission are outlined.

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75A31257# ISSUE 14 PAGE 2068 CATEGORY 52 74/06/00 11 PAGES In ITALIAN UNCLASSIFIED DOCUMENT
TITLE: A determination of maximum anaerobic muscular power, and its meaning as a functional evaluation test
UFTL: Determinazione della massima potenza muscolare anaerobica e suo significato come prova di valutazione funzionale
AUTHORS: A/Rota, P.
CIO: Unknown-- Rivista Di Medicina Aeronautica E Spaziale, Vol. 37, Jan.-June 1974, P. 21-31. In Italian.,
MAJS: /*Aerospace Medicine/*Muscular Strength/*Physiological Tests/*Pilot Performance
MINS: / Athletes/ Biometrics/ Body Weight/ Flight Fitness/ Muscular Function/ Physical Exercise
ABA: S.J.M.
ABSTRACT: Thirty military aviators, trained in different specialties of light athletics, were subjected to a test of maximum anaerobic muscular power after the method of Margaria et al. Values obtained concerning total maximum power and maximum power per unit body weight are compared with athletic results; in addition, a behavioral correlation is attempted. The test is shown to be useful as a means of selecting subjects assigned to work or to athletic activities when exceptional muscular expenditure is required in a short time.

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75A29270 ISSUE 13 PAGE 1937 CATEGORY 52 74/12/00 3 PAGES In FRENCH UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Statistical data on the medical causes of definitive flight inability in the TFP of an airline company --- Technical Flight Personnel
UFTL: Donnees statistiques sur les causes medicales d’inaptitude definitive au vol du P.N.T. d’une compagnie aerienne

AUTHORS: A/Lafontaine, E.; B/Lavernhe, J. ***PAA***: B/(Compagnie Nationale Air France, Paris, France)
CIO: France-- Revue De Medecine Aeronautique Et Spatiale, Vol. 13, 4th Quarter, 1974, P. 273-275. In French.,
MAJS: /*Aerospace Medicine/*Age Factor/*Flight Fitness/*Flying Personnel/* Physical Fitness/*Statistical Analysis
MINS: / Cardiology/ Cardiovascular System/ Civil Aviation/ Health/ Human Pathology/ Neuroses/ Psychological Factors/ Psychosomatics
ABA: (Author)
ABSTRACT: A statistical study is reported which shows that (1) the frequency of definitive inaptitude in technical flight personnel (TFP) increases significantly with age; (2) cardiovascular maladies are the leading cause of this inaptitude, especially coronary insufficiencies with or without infarctions; (3) next to these diseases, neurotic states are the prime contributor, sometimes with an associated somatic factor; and (4) nontraumatic osteoarticular affections and traumatic lesions take the third and fourth places respectively.

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75A14724 ISSUE 3 PAGE 422 CATEGORY 52 74/00/00 10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Effects of hypoxic training on normoxic maximal aerobic power output
AUTHORS: A/Davies, C. T. M.; B/Sargeant, A. J. ***PAA***: B/(London School of Hygiene and Tropical Medicine, London, England)
CIO: United Kingdom-- European Journal Of Applied Physiology, Vol. 33, No. 3, 1974, P. 227-236.,
MAJS: /*Human Performance/*Hypoxia/*Oxygen Consumption/*Physical Exercise/* Physiological Responses
MINS: / Biometrics/ High Altitude/ Leg (Anatomy)/ Muscular Strength/ Physical Work/ Physiological Effects
ABA: T.S.
ABSTRACT: The paper discusses the influence of hypoxia on maximal aerobic power output. One leg submaximal and maximal exercise was studied in four male subjects before and after a five week training program where each subject was used as his own control. The effects of hypoxia as a training stimulus for the improvement of maximal aerobic power output measured under normoxic conditions was evaluated. Results showed no clear evidence that hypoxia has either an additive or potentiating effect with exercise on the improvement of aerobic power output.

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74A30029 ISSUE 13 PAGE 1757 CATEGORY 5 74/01/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Tracking decrement as a result of grip holding endurance --- operator efficiency and biomechanical factors relationship
AUTHORS: A/Bloswick, D. S.; B/Ellis, N. C. ***PAA***: A/(U.S. Army, Picatinny Arsenal, Dover, N.J.); B/(Texas A & M University, Bryan, Tex.)
CIO: United States-- Ergonomics, Vol. 17, Jan. 1974, P. 51-57.,
MAJS: /*Biodynamics/*Muscular Strength/*Operator Performance/*Performance Prediction/*Physical Factors/*Pursuit Tracking/*Work Capacity

MINS: / Ergometers/ Human Factors Engineering/ Physical Work/ Physiological Tests
ABA: (Author)
ABSTRACT: This study explores the feasibility of using the static strength and endurance relationships suggested by Rohmert in 1960 to predict pursuit tracking performance. Ten male subjects are tested on a pursuit rotor before and after being subjected to specific levels of loading on a grip holding device. The loading corresponded to specific levels of each subject's maximum endurance as determined from Rohmert's strength and endurance equation. The hypotheses are: (1) predetermined schedules of strength expenditure cause a systematic decrement in tracking efficiency; and (2) the process of recovering efficiency is dependent upon the expenditure schedules. Resulting data support these hypotheses, suggesting that tracking efficiency can be reliably predicted using some of the strength and endurance relationships postulated by Rohmert.

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74A16001 ISSUE 4 PAGE 474 CATEGORY 4 73/11/00 14 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: An analysis of the mechanical capabilities of heart muscle during hypoxia
AUTHORS: A/Henderson, A. H.; B/Brutsaert, D. L. ***PAA***: B/(Antwerp, Rijksuniversitair Centrum, Antwerp, Belgium)
CIO: Belgium-- Cardiovascular Research, Vol. 7, Nov. 1973, P. 763-776.,
MAJS: /*Heart Function/*Hypoxia/*Muscular Strength/*Myocardium/*Physiological Tests
MINS: / Biodynamics/ Calcium Metabolism/ Cats/ Myocardial Infarction

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74A10125 ISSUE 1 PAGE 21 CATEGORY 5 73/10/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Determination of parachute ripcord pull forces during free-fall Physiological studies of military parachutists via FM/FM telemetry. IV
AUTHORS: A/Reid, D. H.; B/Doerr, J. E.; C/Buckman, J. A. ***PAA***: C/(U.S. Navy, Naval Aerospace Recovery Facility, El Centro, Calif.)
CIO: United States-- Aerospace Medicine, Vol. 44, Oct. 1973, P. 1164-1168. Navy-Supported Research.,
MAJS: /*Biodynamics/*Biotelemetry/*Flight Stress (Biology)/*Free Fall/*Parachute Descent
MINS: / Deployment/ Electrocardiography/ Eye Movements/ Frequency Modulation/ Human Tolerances/ Military Aircraft/ Muscular Strength/ Physiological Tests/ Work Capacity

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73A21504 ISSUE 8 PAGE 934 CATEGORY 5 ***CNT#***: PHS-CD-00140 73/01/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Cardiovascular changes in middle-aged men during two years of training.
AUTHORS: A/Kasch, F. W.; B/Phillips, W. H.; C/Carter, J. E. L.; D/Boyer, J. L. ***PAA***: D/(San Diego State College, San Diego, Calif.)
CIO: United States-- Journal Of Applied Physiology, Vol. 34, Jan. 1973, P. 53-57. Research Supported By The San Diego State College Foundation;,
MAJS: /*Age Factor/*Cardiovascular System/*Hemodynamic Responses/*Physical Exercise/*Pulmonary Functions

MINS: / Anthropometry/ Health/ Heart Diseases/ Heart Rate/ Human Performance/ Physical Fitness/ Ventilation/ Work Capacity

ABA: (Author)

ABSTRACT: Fifteen sedentary middle-aged men (39-60 years, mean 47) were divided into exercise (n = 9) and nonexercise (n = 6) groups for a comparison of the effects of 2 years physical training. Exercise consisted of 60-min sessions, principally running, three times per week. Evaluations were made at 6-month intervals. Mean maximum aerobic capacity improved 17% over the 2-year period from 2.589 to 3.036 1/min in the trained group. Maximum pulmonary ventilation increased 7% from 115 to 123 1/min BTPS. Maximum heart rate decreased 6 beats to 174.

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73A13545* ISSUE 3 PAGE 260 CATEGORY 4 72/11/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: The National Aeronautics and Space Administration-U.S. Public Health Service Health Evaluation and Enhancement Program - Summary of results.

AUTHORS: A/Durbeck, D. C.; B/Heinzelmann, F.; C/Schacter, J.; D/Haskell, W. L.; E/Payne, G. H.; F/Moxley, R. T., Iii; G/Nemiroff, M.; H/Limoncelli, D. D.; I/Arnoldi, L. B.; J/Fox, S. M., Iii ***PAA***: J/(U.S. Public Health Service, National Institute of Health, Rockville, Md.; NASA, Div. of Occupational Medicine, Washington, D.C.)

CIO: United States-- American Journal Of Cardiology, Vol. 30, Nov. 1972, P. 784-790.,

MAJS: /*Health/*Nasa Programs/*Physical Exercise

MINS: / Body Weight/ Cardiovascular System/ Feasibility/ Glycerides/ Heart Function/ Heart Rate/ Human Performance/ Physiological Tests/ Psychological Factors

ABA: (Author)

ABSTRACT: An exercise program was initiated in a federal agency to assess the feasibility of such a program, and to identify the factors that influenced joining, adherence to, and effectiveness of the program. The program was utilized by 237 of the 998 eligible federal employees; mean attendance rate was 1.3 days/week. Those who volunteered perceived a need for increased physical activity, believed they had sufficient time to participate and derived subjective as well as objective benefits. Significant improvements were found in heart rate response to the standard exercise test, body weight, skinfold measurements and triglyceride levels.

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73A10155# ISSUE 1 PAGE 7 CATEGORY 4 72/07/00 10 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT

TITLE: Interrelation between hardness, viscosity, strength, and bioelectric activity of human muscles

UFTL: O vzaimosviazi mezhdu tverdost'iu viazkost'iu, siloi i bioelektricheskoi aktivnost'iu myshts cheloveka

AUTHORS: A/Zimkin, N. V.; B/Pakhomova, T. G. ***PAA***: A/(Leningradskii Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Leningrad, USSR); B/(Khabarovskii Institut Fizicheskoi Kul'tury, Khabarovsk, USSR)

CIO: Ussr-- Fiziologicheskii Zhurnal SSSR, Vol. 58, July 1972, P. 1099-1108. In Russian.,

MAJS: /*Human Body/*Muscular Function/*Muscular Strength/*Myoelectricity

MINS: / Hardness/ Hypoxia/ Ischemia/ Neuromuscular Transmission/ Oxygenation/ Physical Exercise/ Physical Work/ Sleep/ Sympathetic Nervous System/ Tables (Data)/ Viscosity
ABA: A.B.K.
ABSTRACT: Study of the interrelation between various changes in muscle hardness and viscosity, on the one hand, and muscle strength, on the other, both under the action of sleep, hypoxia, and temperature changes while at rest and in connection with static exertions and dynamic work. Peculiarities in these indices are noted in the phasic, postural, and mixed muscles of athletes and untrained individuals. These indices are found to be affected by sleep, ischemia upon application of a tourniquet, a reduction of blood oxygenation, temperature changes, static exertions, and dynamic muscle work with various loads. The changes noted are found to differ not only quantitatively but also in direction. It is suggested that hardness viscosity, and maximum strength of muscles are determined by changes in the state of the muscle itself and in the impulses arriving at the muscles through motor and, possibly, sympathetic nerves.

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72A38148# ISSUE 19 PAGE 2760 CATEGORY 5 72/06/00 2 PAGES In RUSSIAN UNCLASSIFIED DOCUMENT
TITLE: Active leisure and flight longevity
UNOC: Active leisure effect on pilot work efficiency, health maintenance and job longevity
UFTL: Aktivnyi otdykh i letnoe dolgoletie
AUTHORS: A/Babiichuk, A.
CIO: Unknown-- Aviatsiia I Kosmonavtika, June 1972, P. 24, 25. In Russian.,
MAJS: /*Flight Fitness/*Health/*Pilot Performance
MINS: / Body Weight/ Efficiency/ Flight Stress/ Physical Exercise/ Work Capacity
ABA: A.B.K.
ABSTRACT: Consideration of the problem of maintaining pilot efficiency and health under conditions of little movement but high stress. The relation between the degree of job sedentariness and the state of health of the individual is illustrated by examples involving people other than pilots. The need for pilots to engage in an active, organized leisure, where they are kept on the go and made to perform numerous exercise routines, is stressed in order to improve their work efficiency and prolong their job longevity. An experiment involving the exposure of pilots to two-weeks of active leisure is described, citing results which demonstrate the great effectiveness of this kind of leisure in achieving weight reductions and significant improvements in health indices.

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72A35822 ISSUE 17 PAGE 2505 CATEGORY 4 72/07/11 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Work capacity and physiologic responses to work - Men born in 1913.
UNOC: Work capacity and physiological responses to maximum exercise in 54 year old men in relation to heart disease and cardiovascular hazard studies
AUTHORS: A/Grimby, G.; B/Bjure, J.; C/Aurell, M.; D/Ekstrom-Jodal, B.; E/Tibblin, G.; F/Wilhelmsen, L. ***PAA***: F/(Goteborg, University, Goteborg, Sweden)
CIO: Sweden-- American Journal Of Cardiology, Vol. 30, July 11, 1972, P. 37-42. Research Supported By Forenade Liv.,

MAJS: /*Age Factor/*Cardiology/*Heart Diseases/*Physical Exercise/*Physiological Responses/*Work Capacity
MINS: / Cardiovascular System/ Electrocardiography/ Health/ Human Performance/ Myocardium
ABA: F.R.L.
ABSTRACT: Results of a maximal exercise test performed by a group of 793 54-yr-old men. The purpose was to increase the basic data of a prospective study of ischemic heart disease and other pathological conditions, to study cross-sectionally the physical performance of the population (the occurrence of anginal pain and electrocardiographic anomalies at standardized work loads, comparing these data to other relevant data in the population), and to collect randomly selected control material for comparing groups with different diseases, e.g., patients with myocardial infarction. The study appears to show that a high percentage of 54-yr-old men can perform maximal exercise without demonstrable evidence of increased probability of cardiovascular hazards.

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72A24796 ISSUE 10 PAGE 1431 CATEGORY 5 72/02/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Effects of pressure suits on seven psychomotor skills.
UNOC: Pressure suit effects on psychomotor skills, testing manual dexterity, tracking skills, hand strength, steadiness and coordination for pressurized, unpressurized and shirtsleeve conditions
AUTHORS: A/Huchingson, R. D. ***PAA***: A/(Texas A & M University, College Station, Tex.)
CIO: United States-- Perceptual And Motor Skills, Vol. 34, Feb. 1972, P. 87-92.,
MAJS: /*Operator Performance/*Pressure Suits/*Psychomotor Performance
MINS: / Human Factors Engineering/ Muscular Strength/ Physiological Tests/ Pressurizing/ Psychological Tests/ Rank Tests/ Statistical Correlation/ Tracking (Position)/ Visual Tasks
ABA: (Author)
ABSTRACT: A battery of tests measuring 7 psychomotor skills were administered to Ss under 5 conditions: an older pressure suit, pressurized and unpressurized; a more recent pressure suit, pressurized and unpressurized; and shirtsleeve conditions. Test performance involving manual dexterity with and without tools was degraded more by suit conditions than was test performance involving arm and wrist movement such as tracking. Performance with the older, USN Mark IV suit at 2.0 psig closely approximated performance with the Gemini 3C-8 at 3.5 psig, which supports the feasibility of using older suits for selected types of psychomotor research.

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71A38887 ISSUE 20 PAGE 3185 CATEGORY 4 71/00/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Maximal aerobic and anaerobic power and stroke volume of the heart in a subalpine population
UNOC: Heart maximal aerobic and anaerobic power and stroke volume, discussing cardiac output and blood oxygen capacity measurements in subalpine population subjects
AUTHORS: A/Mariani, M.; B/Steplock, D. A.; C/Veicsteinas, A. ***Pan***: (Aa/Milano, Universita, Milan, Italy/.)

CIO: Italy-- Internationale Zeitschrift Fuer Angewandte Physiologie Einschliesslich Arbeitsphysiologie, Vol. 29, No. 3, P. 203-214.. Research Supported By The Consiglio Nazionale Delle Ricerche..
MAJS: /*Blood Circulation/*Heart Function/*Heart Minute Volume/*Oxygen Consumption
MINS: / Body Weight/ Cardiology/ Cardiovascular System/ Muscular Strength/ Physical Exercise/ Work Capacity

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71A37483 ISSUE 19 PAGE 3006 CATEGORY 5 71/08/00 3 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: The application of heat stress indices
UNOC: Human heat stress evaluation indices, discussing acclimatization, dehydration, clothing, age, physical fitness, health and sex effects
AUTHORS: A/Humphreys, C. M. ***Pan***: (Aa/U.S. Public Health Service, Bureau Of Occupational Safety And Health, Cincinnati, Ohio/.)
CIO: United States-- /Southeastern Industrial Health Conference, Gatlinburg, Tenn., Sep. 30-Oct. 2, 1970./. Journal Of Occupational Medicine, Vol. 13, P. 377-379..
MAJS: /*Human Reactions/*Stress (Physiology)/*Temperature Effects
MINS: / Acclimatization/ Aging (Biology)/ Clothing/ Conferences/ Dehydration/ Health/ Physical Fitness

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71A34359 ISSUE 17 PAGE 2688 CATEGORY 5 71/01/00 9 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Mechanical and physiological efficiency of muscular work with different muscle groups
UNOC: Work load and maximum physical exercise duration relationship for forearm reciprocating flexion and extension, cranking of both arms and bicycle pedalling
AUTHORS: A/Morioka, M.; B/Numajiri, K.; C/Onishi, N.; D/Sasaki, N. ***Pan***: (Ad/Inst. For Science Of Labor, Tokyo, Japan/.)
CIO: Japan-- /Japan Assn. Of Industrial Health, Symposium On Methodology Of Fatigue Assessment, Kyoto, Japan, Sep. 22-27, 1969./. Ergonomics, Vol. 14, P. 61-69..
MAJS: /*Muscular Fatigue/*Physical Exercise/*Work Capacity
MINS: / Conferences/ Ergometers/ Forearm/ Heart Rate/ Muscular Strength/ Oxygen Consumption

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71A33247 ISSUE 16 PAGE 2530 CATEGORY 4 71/06/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Effect of a steady-state exercise on maximal anaerobic power in man
UNOC: Maximal human anaerobic power, discussing unsplit phosphagen concentration in muscles during steady state exercise
AUTHORS: A/Aghemo, P.; B/Derevenco, P.; C/Di Prampero, P. E.; D/Margaria, R.; E/Mariani, M. ***Pan***: (Ae/Milano, Universita, Milan, Italy/.)
CIO: Italy-- Journal Of Applied Physiology, Vol. 30, P. 885-889.. Research Supported By The Consiglio Nazionale Delle Ricerche..
MAJS: /*Human Performance/*Muscular Strength/*Oxygen Consumption/*Phosphorus Compounds/*Physical Exercise

MINS: / Adenosine Triphosphate/ Anaerobes/ Blood/ Creatine/ Lactic Acid/ Maxima/ Muscular Function/ Oxygen Metabolism/ Physical Fitness
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71A33114 ISSUE 16 PAGE 2528 CATEGORY 4 71/06/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Physical fitness, flight requirements and age
UNOC: Physical fitness relation to flight requirements, pilot performance and age, considering muscular strength, cardio-respiratory capacity, body weight and mental aspects
AUTHORS: A/Goldman, R. F. ***Pan***: (Aa/U.S. Army, Research Inst. Of Environmental Medicine, Natick, Mass./.)
CIO: United States-- Aerospace Medicine, Vol. 42, P. 635-641..
MAJS: /*Age Factor/*Flight Fitness/*Physical Fitness/*Physiological Tests/*Pilot Performance
MINS: / Body Weight/ Heart Function/ Mental Performance/ Muscular Strength/ Respiratory Rate

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71A20725 ISSUE 8 PAGE 1245 CATEGORY 5 71/00/00 16 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Health maintenance of aircrewmen
UNOC: Preventive and clinical medicine effect on aircrew health maintenance
AUTHORS: A/Farmer, R. A. ***Pan***: (Aa/Usaf, Office Of The Surgeon General, Washington, D.C./.)
CIO: United States-- Baltimore,, Williams And Wilkins Co.,, In- Aerospace Medicine /2nd Edition/. Edited By H. W. Randel. /A71-20701 08-05/ P. 586-601..
MAJS: /*Clinical Medicine/*Flight Fitness/*Flight Safety/*Health/*Physical Fitness/*Pilot Performance
MINS: / Accident Prevention/ Diets/ Flight Fatigue/ Nutrition/ Signs And Symptoms

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70A34592 ISSUE 17 PAGE 3024 CATEGORY 4 70/00/00 8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: A study on training effect on strength per unit cross-sectional area of muscle by means of ultrasonic measurement
UNOC: Training effect on strength per unit cross sectional area of arm muscle, using ultrasonic measurement
AUTHORS: A/Fukunaga, T.; B/Ikai, M. ***Pan***: (Aa/Tokyo, U., Tokyo, Japan/.)
CIO: Japan-- Internationale Zeitschrift Fuer Angewandte Physiologie Einschliesslich Arbeitsphysiologie, Vol. 28, No. 3, P. 173-180..
MAJS: /*Arm (Anatomy)/*Muscular Strength/*Physical Exercise/*Ultrasonic Tests
MINS: / Flexors/ Human Performance

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70A19525# ISSUE 7 PAGE 1221 CATEGORY 5 69/10/00 4 PAGES In RUSSIAN IN RUSSIAN. UNCLASSIFIED DOCUMENT
TITLE: Twin veloergometric assembly for competitive activity simulation

UNOC: Veloergometric assembly using two bicycles for simultaneously measuring muscular motor activity of persons in competition
UFTL: Parnaia veloergometricheskaia ustanovka dlia modelirovaniia sorevnovatel'noi deiatel'nosti
AUTHORS: A/Menialin, A. Ia.; B/Razumov, S. A. ***Pan***: (Aa/Institut Fizicheskoi Kul'tury, Leningrad, Ussr/.)
CIO: Ussr-- Fiziologicheskii Zhurnal Sssr, Vol. 55, P. 1293-1296..
MAJS: /*Ergometers/*Human Performance/*Muscular Function/*Muscular Strength/* Performance Tests
MINS: / Activity (Biology)/ Biotechnology/ Physiological Tests

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70A18787# ISSUE 7 PAGE 1201 CATEGORY 4 69/00/00 8 PAGES In POLISH IN POLISH. UNCLASSIFIED DOCUMENT
TITLE: Estimate of the correlation among tolerance to positive accelerations in the z axis, results of functional tests, and the development of some motoric qualities
UNOC: Centripetal acceleration tolerance level correlated with circulatory system functional tests and physical exercises, discussing strength and speed endurance
UFTL: Ocena wspolzaleznosci miedzy znoszeniem przyspieszen w osi plus Gz, wynikami prob czynnosciowych a rozwojem wybranych cech motorycznych
AUTHORS: A/Dziuk, Z.; B/Sulajnis, H.; C/Wojtkowiak, M.
CIO: Unknown-- /Polskie Towarzystwo Astronautyczne And Polskie Towarzystwo Fizjologiczne, Sympozjum Poswiecone Zagadnieniom Wplywu Zmian Grawitacji Na Ustroj, Warsaw, Poland, Mar. 1, 1969./. Postepy Astronautyki, Vol. 3, No. 4, P. 49-56..
MAJS: /*Acceleration Tolerance/*Centripetal Force/*Circulatory System/*Data Correlation/*Physical Exercise
MINS: / Astronaut Training/ Conferences/ Human Performance/ Muscular Strength/ Pilot Training

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70A13403# ISSUE 3 PAGE 420 CATEGORY 4 69/09/00 4 PAGES In RUSSIAN IN RUSSIAN. UNCLASSIFIED DOCUMENT
TITLE: Changes in vascular reflexes due to myogenic activity
UNOC: Plethysmographic investigation of myogenic load influencing sportsmen central nervous systems state, tabulating short and long distance running results
UFTL: Izmenenie sosudistykh refleksov pod vozdeistviem myshechnoi deiatel'nosti
AUTHORS: A/Iusupova, M. M.
CIO: Ussr-- Akademiia Nauk Kazakhskoi Ssr, Vestnik, Vol. 25, P. 66-69..
MAJS: /*Central Nervous System/*Human Performance/*Muscles/*Plethysmography/* Running
MINS: / Muscular Fatigue/ Muscular Strength/ Physical Exercise/ Physical Fitness / Physical Work/ Tables (Data)

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70A11708 ISSUE 2 PAGE 231 CATEGORY 4 ***CNT#***: PHS-HE-05157 69/05/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Muscle force and electromyogram with alteration in flow and composition of blood

UNOC: Muscle force and electromyogram behavior with alteration in blood flow and composition in anesthetized cats
AUTHORS: A/Sonnenschein, R. R.; B/Wright, D. L. ***Pan***: (Aa/California, U., School Of Medicine, Dept. Of Physiology, Los Angeles, Calif./.)
CIO: United States-- American Journal Of Physiology, Vol. 216, P. 1075-1080..
MAJS: /*Blood Flow/*Cats/*Electromyography/*Muscular Strength/*Physiological Responses
MINS: / Chemical Composition/ Hypoxemia/ Physiological Tests

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69A38919* ISSUE 21 PAGE 3663 CATEGORY 5 ***CNT#***: NASW-1428 69/06/00 8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: The design of physical activity programs for industry.
UNOC: Physical activity programs in industry for selected employees as routine component of occupational health programs
AUTHORS: A/Duggar, B. C.; B/Swengros, G. V. ***Pan***: (Aa/Bio-Dynamics, Inc., Cambridge, Mass./ Ab/Fitness, Inc., Washington, D.C./.)
CIO: United States-- /American Industrial Hygiene Conference, St. Louis, Mo., May 17, 1968./. Journal Of Occupational Medicine, Vol. 11, P. 322-329..
MAJS: /*Health/*Physical Exercise/*Physical Fitness
MINS: / Diseases/ Industrial Safety/ Occupation

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69A38901 ISSUE 21 PAGE 3653 CATEGORY 4 69/00/00 17 PAGES In GERMAN IN GERMAN. UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Dynamometer measurements of muscle function during periods of decreased activity and reduced caloric and protein intake
UNOC: Muscular strength dynamometric measurements in subjects during prolonged inactivity with restricted caloric and protein intake, showing decrease in strength
UFTL: Muskelfunktionspruefungen mit hilfe von dynamometermessungen unter einfluss mangelnder aktivitaet und restriktiver calorien- und eiweissaufnahme
AUTHORS: A/Wirths, W. ***Pan***: (Aa/Max-Planck-Institut Fuer Ernaeahrungsphysiologie, Dortmund, West Germany/.)
CIO: Germany-- Internationale Zeitschrift Fuer Angewandte Physiologie Einschliesslich Arbeitsphysiologie, Vol. 27, No. 2, P. 116- 132..
MAJS: /*Biological Effects/*Caloric Requirements/*Hypodynamia/*Muscular Strength /*Protein Metabolism
MINS: / Diets/ Dynamometers/ Human Reactions/ Physiological Tests

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69A35085# ISSUE 18 PAGE 3098 CATEGORY 5 69/00/00 8 PAGES UNCLASSIFIED DOCUMENT
TITLE: The structure of complex physical performance.
UNOC: Factor analysis of complex perceptual-motor performance of man, measuring speed, flexibility, balance and strength
AUTHORS: A/Hilsendager, D.; B/Karnes, E. W.; C/Spiritoso, T. ***Pan***: (Ab/Martin Marietta Corp., Denver, Colo./, Ac/Temple U., Philadelphia, Pa./.)

CIO: Unknown-- In- Space, Technology, And Society, Canaveral Council Of Technical Societies, Space Congress, 6th, Cocoa Beach, Fla., Mar. 17-19, 1969, Proceedings. Volume 1. P. 6-1 To 6-8. <A69-35070 18-34<. Cape Canaveral, Fla.,, Canaveral Council Of Technical Societies,,
MAJS: /*Factor Analysis/*Human Performance/*Sensorimotor Performance/*Task Complexity
MINS: / Balance/ Conferences/ Flexibility/ Human Factors Engineering/ Muscular Strength

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69A14205# ISSUE 3 PAGE 377 CATEGORY 4 67/00/00 5 PAGES In RUSSIAN IN RUSSIAN. UNCLASSIFIED DOCUMENT
TITLE: Investigation of the motor activity of man under conditions of hypodynamia and increased CO sub 2 content
UNOC: Human motor activity under hypodynamia and increased carbon dioxide, discussing positive effects of prescribed physical exercises
UFTL: Issledovanie dvigatel'noi deiatel'nosti cheloveka v usloviiakh gipodinamii i povyshennogo soderzhaniia SO sub 2
AUTHORS: A/Karpova, L. I.
CIO: Ussr-- Moscow,, Moskovskoe Fiziologicheskoe Obshchestvo,, In- Aviation And Space Medicine <Aviakosmicheskaia Meditsina<. Edited By V. V. Parin And I. M. Khazen. /Sektsiia Aviatsionnoi I Kosmicheskoi Meditsiny, Trudy, No. 1, P. 152-156..
MAJS: /*Body Kinematics/*Carbon Dioxide Concentration/*Efferent Nervous Systems /*Human Tolerances/*Hypoxemia
MINS: / Aerospace Medicine/ Human Reactions/ Muscular Strength/ Physical Exercise

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68A44082# ISSUE 23 PAGE 4351 CATEGORY 4 67/00/00 9 PAGES In RUSSIAN IN RUSSIAN. UNCLASSIFIED DOCUMENT
TITLE: Investigation of the human motor function under the conditions of an altered daily rhythm
UNOC: Altered daily rhythm effect on muscular functions, emphasizing capacity of intentionally straining and relaxing skeletal muscles and latent time of action
UFTL: Issledovanie dvigatel'noi funktsii cheloveka v usloviiakh izmenennogo sutochnogo rezhima
AUTHORS: A/Devishvili, V. M.; B/Dushkov, B. A.; C/Korobkov, A. V.; D/Mirskii, M. M.; E/Ratishvili, G. G.; F/Ratov, I. P.
CIO: Ussr P. 159-167.-- Moscow,, Izdatel'stvo Meditsina,, In- Studies On The Psychophysiology Of The Work Of Cosmonauts <Ocherki Psikhofiziologii Truda Kosmonavtov<. Edited By N. N. Gurovskii..
MAJS: /*Circadian Rhythms/*Muscular Function/*Musculoskeletal System/*Physical Exercise
MINS: / Biological Effects/ Human Body/ Muscular Strength/ Muscular Tonus/ Time Lag

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68A44081# ISSUE 23 PAGE 4351 CATEGORY 4 67/00/00 12 PAGES In RUSSIAN IN RUSSIAN. UNCLASSIFIED DOCUMENT
TITLE: Significance of muscular activity for conserving stability of the motor function of a cosmonaut

UNOC: Physical training for better adaptation to environmental changes during prolonged hypodynamia and altered daily rhythm
UFTL: Znachenie myshechnoi aktivnosti dlia sokhraneniia ustoichivosti dvigatel'noi funktsii kosmonavta
AUTHORS: A/Dushkov, B. A.; B/Korobkov, A. V.
CIO: Ussr P. 148-159.-- Moscow,, Izdatel'stvo Meditsina,, In- Studies On The Psychophysiology Of The Work Of Cosmonauts <Ocherki Psikhofiziologii Truda Kosmonavtov<. Edited By N. N. Gurovskii..
MAJS: /*Astronaut Performance/*Environmental Control/*Muscular Function/* Physical Exercise/*Physiological Effects/*Rhythm (Biology)
MINS: / Efferent Nervous Systems/ Muscular Strength/ Muscular Tonus/ Relaxation (Physiology)/ Work Capacity

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68A18238# ISSUE 6 PAGE 967 CATEGORY 4 67/09/00 10 PAGES In ITALIAN IN ITALIAN. UNCLASSIFIED DOCUMENT
TITLE: Changes in duration of the QT interval of the EKG during muscular exercise. II
UNOC: QT interval changes in EKG of subjects during strenuous muscular exercise performed with cycloergometer
UFTL: Modificazioni della durata dell'intervallo QT nell'elettrocardiogramma durante lavoro muscolare. II
AUTHORS: A/Busnengo, E.; B/Rota, P.
CIO: Unknown-- /Societa Latina Di Medicina Dello Sport, Congresso Internazionale, 6th, Rome, Italy, Jun. 5-8, 1967./. Rivista Di Medicina Aeronautica E Spaziale, Vol. 30, P. 425-436.,
MAJS: /*Cardiac Ventricles/*Electrocardiography/*Heart Rate/*Muscular Fatigue/* Physical Exercise
MINS: / Cardiology/ Ergometers/ Muscular Strength/ Physiological Responses/ Time Response/ Vectorcardiography

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90N70579* ISSUE 12 CATEGORY 51 ***RPT#***: NASA-CR-186366 NAS 1.26:186366 87/00/00 198 PAGES UNCLASSIFIED DOCUMENT
TITLE: Occupational Health Meeting, National Aeronautics and Space Administration: Conference proceedings
CORP: BioTechnology, Inc., Falls Church, VA.
SAP: Avail: CASI HC A09
CIO: United States Sponsored By Nasa, Washington, Dc Conference Held In San-- Diego, Ca, 2-6 Nov. 1987
MAJS: /*Conferences/*Exposure/*Health/*Information Systems/*Nasa Programs/*Risk /*Space Stations/*Standards
MINS: / Asbestos/ Drugs/ Heart Diseases/ Hypertension/ Physical Exercise/ Viruses

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90N70511* ISSUE 10 CATEGORY 52 ***RPT#***: NASA-CR-186148 NAS 1.26:186148 CNT#: NAG2-414 NIH-AR-36266 88/00/00 44 PAGES UNCLASSIFIED DOCUMENT
TITLE: Skeletal muscle growth is stimulated by intermittent stretch/relaxation in tissue culture

AUTHORS: A/Vandenburgh, Herman H.; B/Hatfaludy, Sophia; C/Karlisch, Patricia; D/Shansky, Janet
CORP: Miriam Hospital, Providence, RI.; Brown Univ., Providence, RI. ***CSS***: (Dept. of Pathology and Laboratory Medicine.)
SAP: Avail: CASI HC A03
CIO: United States Submitted For Publication Prepared In Cooperation With Brown-- Univ., Providence, Ri
MAJS: /*Exercise Physiology/*Muscular Function/*Muscular Strength/*Muscular Tonus/*Musculoskeletal System
MINS: / Physiological Effects/ Protein Synthesis/ Tissues (Biology)

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89N70143# ISSUE 4 CATEGORY 52 ***RPT#***: AD-A196460 ***CNT#***: DAMD17-86-G-6015 DA PROJ. 3M1-61102-BS-15 87/05/00 89 PAGES UNCLASSIFIED DOCUMENT
TITLE: Cardiopulmonary effects of acute stressful exercise at altitude (2300m) of individuals with Sickle Cell Trait (SCT) ***TLSP***: Annual Report, 1 May 1986 - 30 Apr. 1987
AUTHORS: A/Weisman, Idelle M.; B/Zeballos, R. Jorge; C/Martin, Timothy W.
CORP: National Jewish Hospital and Research Center, Denver, CO. ***CSS***: (Immunology and Respiratory Medicine Div.)
SAP: Avail: CASI HC A05/MF A01
CIO: United States--
MAJS: /*Altitude Simulation/*Anemias/*Blood/*Cardiovascular System/*Heart Function/*Hemoglobin/*Hypoxia/*Physical Exercise/*Stress (Physiology)
MINS: / Breathing/ Environment Simulation/ Erythrocytes/ Hazards/ Health/ Human Performance/ Physiological Responses/ Pulmonary Functions

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88N70795* ISSUE 13 CATEGORY 52 ***RPT#***: NASA-TT-F-14824 ***CNT#***: NASW-2485 73/02/00 23 PAGES UNCLASSIFIED DOCUMENT
TITLE: A method of conducting physical training on the K.T.F.
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: CASI HC A03
CIO: USSR Transl. By Techtran Corp., Silver Spring, Md. Transl. Into ENGLISH-- Of Metodika Provedeniya Fizicheskoy Trenirovki Na K.T.F. (Moscow, USSR, Academy Of Sciences), 1973 12 P
MAJS: /*Aerospace Medicine/*Astronaut Training/*Physical Exercise
MINS: / Atrophy/ Muscular Strength/ Orthostatic Tolerance/ Prevention

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87N70584# ISSUE 20 CATEGORY 52 ***RPT#***: AD-A181327 ***CNT#***: DAMD17-80-C-0089 DA PROJ. 3F1-62777-A-878 84/09/00 91 PAGES UNCLASSIFIED DOCUMENT
TITLE: Neck muscle endurance and fatigue as a function of helmet loading: The definitive mathematical model ***TLSP***: Final Annual Report, 1 Jun. 1980 - 15 Jun. 1984
AUTHORS: A/Phillips, Chandler A.; B/Petrofsky, Jerrold S.
CORP: Wright State Univ., Dayton, OH.
SAP: Avail: CASI HC A05/MF A01
CIO: United States--

MAJS: /*Fatigue Life/*Head (Anatomy)/*Helmets/*Human Reactions/*Load Distribution (Forces)/*Muscular Fatigue/*Muscular Function/*Muscular Strength/*Neck (Anatomy)/*Physiological Responses/*Protective Clothing/* Static Loads
MINS: / Boundaries/ Center Of Gravity/ Computerized Simulation/ Contraction/ Dynamometers/ Input/ Mathematical Models/ Physical Fitness/ Positioning/ Symmetry/ Time/ Vertical Orientation

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87N70430* ISSUE 16 CATEGORY 14 ***RPT#***: NASA-TM-83100 NAS 1.15:83100 CNT#: NAS10-10285 85/03/00 15 PAGES UNCLASSIFIED DOCUMENT
TITLE: Physical and physiological characteristics of 1983 Pan Am World Services Eastern Test Range Security Police Peacekeeper Team
AUTHORS: A/Frey, Mary Anne Bassett; B/Loffek, Susan P.; C/Spitler, Diane L. ***PAA***: C/(Bionetics Corp., Cocoa Beach, Fla.)
CORP: National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
SAP: Avail: CASI HC A03
CIO: United States--
MAJS: /*Biochemistry/*Cardiovascular System/*Competition/*Muscular Strength/* Physical Fitness/*Police/*Pulmonary Functions
MINS: / Airport Security/ Blood/ Hematology/ Treadmills

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83N74945# ISSUE 13 CATEGORY 52 ***RPT#***: PB83-140368 ***CNT#***: PHS-NIOSH-210-80-0084 81/08/00 200 PAGES UNCLASSIFIED DOCUMENT
TITLE: Factors for establishing permissible limits for one-handed lifts by women
AUTHORS: A/Garg, A.; B/Saxena, U.
CORP: Wisconsin Univ., Milwaukee, WI. ***CSS***: (Dept. of Human Kinetics.) AVAIL.CASI
SAP: Avail: CASI HC A09/MF A03
CIO: United States--
MAJS: /*Arm (Anatomy)/*Females/*Physical Factors/*Physical Work
MINS: / Muscular Strength/ Physical Fitness/ Physiological Factors/ Range (Extremes)/ Work

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79N75149 ISSUE 10 CATEGORY 52 78/00/00 9 PAGES UNCLASSIFIED DOCUMENT
TITLE: Isokinetic exercise: A review of the literature
CORP: Harding Coll., Searcy, AR. AVAIL.CASI
SAP: Avail: CASI HC A02
CIO: United States--
MAJS: /*Human Body/*Muscular Tonus/*Physical Exercise
MINS: / Human Factors Engineering/ Muscular Strength/ Physical Fitness

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79N73056* ISSUE 34 CATEGORY 54 ***RPT#***: NASA-CR-104005 TM-68-1011-10 CNT#: NASW-417 68/12/27 12 PAGES UNCLASSIFIED DOCUMENT
TITLE: Personal maintenance subsequence for a multi-disciplinary earth orbital space station
AUTHORS: A/Penn, S. L.; B/Robinson, M. A.
CORP: Bellcomm, Inc., Washington, DC.

SAP: Avail: CASI HC A03
CIO: United States--
MAJS: /*Human Factors Engineering/*Mission Planning/*Space Stations
MINS: / Health/ Hygiene/ Maintenance/ Physical Exercise/ Recreation/ Rest

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78N77573# ISSUE 17 CATEGORY 52 78/07/12 9 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Substantiation of a set of preventive measures referable to the objectives of missions in the Salyut orbital station
AUTHORS: A/Kakurin, L. I.; B/Katkovskiy, B. S.; C/Tishler, V. A.; D/Kozyrevskaya, G. I.; E/Shashkov, V. S.; F/Georgiyevskiy, V. S.; G/Grigoryev, A. I.; H/Mikhaylov, V. M.; I/Anashkin, O. D.; J/Machinskiy, G. V.
CORP: Joint Publications Research Service, Arlington, VA. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A02 In its Space Biol. and Aerospace Med., No. 3, 1978 (JPRS-71446) p 23-31 (SEE N78-77569 17-51)
CIO: USSR Transl. Into ENGLISH From Kosm. Biol. Aviakosm. Med. (Moscow), No.-- 3, 1978 P 20-27
MAJS: /*Aerospace Medicine/*Exobiology/*Gravitational Effects/*Human Body/* Physical Exercise/*Salyut Space Station
MINS: / Enzyme Activity/ Hypokinesia/ Muscular Strength/ U.S.S.R.

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77N75105* ISSUE 8 CATEGORY 52 ***RPT#***: NASA-TM-74581 66/00/00 12 PAGES UNCLASSIFIED DOCUMENT
TITLE: Effects of progressive hypohydration on maximal isometric muscular strength
AUTHORS: A/Terjung, R. L.; B/Bosco, J. S.; C/Greenleaf, J. E.
CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA. AVAIL.CASI
SAP: Avail: CASI HC A03
CIO: United States--
MAJS: /*Dehydration/*Human Beings/*Muscular Strength/*Physiological Responses
MINS: / Anthropometry/ Dynamometers/ Physical Exercise

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74N76469 ISSUE 20 CATEGORY 99 ***RPT#***: DCIEM-74-R-1012 74/03/00 13 PAGES UNCLASSIFIED DOCUMENT DCAF F207200
TITLE: Health problems and vitamin C in Canadian northern military operations
AUTHORS: A/Sabiston, B. H.; B/Radomski, M. W.
CORP: Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario). AVAIL.CASI
SAP: Avail: CASI HC A03
CIO: CANADA Presented At The 25th Symp. Of The Defence Res. Board, Downsview,-- Ontario, 14 Nov. 1973
MAJS: /*Ascorbic Acid/*Health
MINS: / Armed Forces (Foreign)/ Canada/ Physical Fitness

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97N11755*# ISSUE 1 CATEGORY 54 ISSN 0096-1736 ***RPT#***: NASA-TM-111725 NAS 1.15:111725 NIPS-96-98176 90/07/01 8 PAGES UNCLASSIFIED DOCUMENT

TITLE: An Occupational Performance Test Validation Program for Fire Fighters at the Kennedy Space Center

AUTHORS: A/Schonfeld, Brian R.; B/Doerr, Donald F.; C/Convertino, Victor A.

CORP: National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.

SAP: Avail: CASI HC A02/MF A01

CIO: United States--

MAJS: /*Fire Fighting/*Human Performance/*Physical Fitness/*Physiological Responses/*Physiological Tests/*Regression Analysis

MINS: / Ground Stations/ Heart Rate/ Males/ Muscular Strength/ Nasa Programs/ Performance Prediction/ Physical Exercise/ Rescue Operations/ Stairways/ Time Dependence/ Treadmills

ABA: Author

ABSTRACT: We evaluated performance of a modified Combat Task Test (CTT) and of standard fitness tests in 20 male subjects to assess the prediction of occupational performance standards for Kennedy Space Center fire fighters. The CTT consisted of stair-climbing, a chopping simulation, and a victim rescue simulation. Average CTT performance time was 3.61 +/- 0.25 min (SEM) and all CTT tasks required 93% to 97% maximal heart rate. By using scores from the standard fitness tests, a multiple linear regression model was fitted to each parameter: the stairclimb (r(exp 2) = .905, P less than .05), the chopping performance time (r(exp 2) = .582, P less than .05), the victim rescue time (r(exp 2) = .218, P = not significant), and the total performance time (r(exp 2) = .769, P less than .05). Treadmill time was the predominant variable, being the major predictor in two of four models. These results indicated that standardized fitness tests can predict performance on some CTT tasks and that test predictors were amenable to exercise training.

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96N36091*# ISSUE 12 CATEGORY 52 95/12/01 8 PAGES In JAPANESE UNCLASSIFIED DOCUMENT

TITLE: Grip Strength Training on WAF Recruit

AUTHORS: A/Nomiyama, Takenori; B/Takeuchi, Yoshiniori; C/Kadoo, Atsushi; D/Mizumoto, Chieko; E/Takeuchi, Akihiko; F/Utsuki, Narisuke

CORP: Japanese Air Self-Defense Force, Tokyo (Japan). ***CSS***: (Aeromedical Lab.)

SAP: Avail: CASI HC A02/MF A01 In its The Reports of Aeromedical Laboratory p 131-136 (SEE N96-36086 12-51)

CIO: Japan--

MAJS: /*Hand (Anatomy)/*Muscular Strength

MINS: / Physical Exercise/ Standard Deviation/ Training Devices

ABA: Author

ABSTRACT: Twenty three right-handed WAF recruits were studied regarding the effects of muscular training on the hand grip strength during their three-month initial training course. The half of the subjects participated in hand grip training every evening and their grip strength data were compared to that of the other subjects who did not participate in this practicing. Average grip strength increased by 4 kg in the training group and 2 kg in the

non-training group. The between group difference was statistically significant for the left hand.

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96N31380*# ISSUE 12 CATEGORY 54 ***RPT#***: IMASSA-95-24 NIPS-96-59094 ETN-96-90520
CNT#: MISSION-INNOVATION-93/061/S 95/07/01 24 PAGES In FRENCH
UNCLASSIFIED DOCUMENT

TITLE: Construction of an ergometer for measuring the muscular strength of aircraft pilots
TLSP: Final Report

UFTL: Realisation d'un ergometre de mesure des puissances musculaires des pilotes d'aeronefs

AUTHORS: A/Guezennec, C. Y.; B/Bigard, A. X.; C/Plagnes, D.; D/Bouron, F.; E/Serra, M.; F/Faux, F.; G/Lacheze

CORP: Centre d'Etudes et de Recherches de Medecine Aerospatiale, Bretigny sur Orge (France).
CSS: (Dept. de Physiologie Systemique et Service Instrumentation.)

SAP: Avail: CASI HC A03/MF A01

CIO: France France--

MAJS: /*Aircraft Pilots/*Ergometers/*Muscular Strength/*Pilot Training/*Sitting Position

MINS: / Aerospace Medicine/ Limbs (Anatomy)/ Muscular Fatigue/ Physical Exercise / Physical Fitness/ Physical Work/ Pilot Performance/ Spine

ABA: Author (ESA)

ABSTRACT: The ergometer developed to measure the capabilities of the pilot's muscles involved in aircraft flying activities is described. The device was used to measure the forces generated by the cervical spine, and the upper and lower limbs. The maximum volitional force and the time during which a fraction of this force is maintained can be measured on a subject sitting in a position similar to that of a pilot in an airplane. The practical conditions of using this system were tested. The ergometer is designed to be used for measuring the initial fitness of air force pilots, and for following their progress during physical training.

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96N25037*# ISSUE 9 CATEGORY 54 94/05/01 8 PAGES UNCLASSIFIED DOCUMENT

TITLE: Use of Video Analysis System for Working Posture Evaluations

AUTHORS: A/Mckay, Timothy D.; B/Whitmore, Mihriban

CORP: Lockheed Martin Engineering and Sciences Co., Houston, TX.

SAP: Avail: CASI HC A02/MF A04 In Lockheed Martin Engineering and Sciences Co., Dual-Use Space Technology Transfer Conference and Exhibition p 195-202 (SEE N96-25018 09-99)

CIO: United States--

MAJS: /*Applications Programs (Computers)/*Human Factors Engineering/*Human Performance/*Posture/*Technology Utilization/*Video Data/*Workloads (Psychophysiology)

MINS: / Anthropometry/ Data Reduction/ Government/Industry Relations/ Graphical User Interface/ Physical Fitness/ Tasks/ Technology Transfer/ Work Capacity/ Workstations

ABA: Author

ABSTRACT: In a work environment, it is important to identify and quantify the relationship among work activities, working posture, and workplace design. Working posture may impact the physical comfort and well-being of individuals, as well as performance. The Posture Video Analysis Tool (PVAT) is an interactive menu and button driven software

prototype written in Supercard (trademark). Human Factors analysts are provided with a predefined set of options typically associated with postural assessments and human performance issues. Once options have been selected, the program is used to evaluate working posture and dynamic tasks from video footage. PVAT has been used to evaluate postures from Orbiter missions, as well as from experimental testing of prototype glove box designs. PVAT can be used for video analysis in a number of industries, with little or no modification. It can contribute to various aspects of workplace design such as training, task allocations, procedural analyses, and hardware usability evaluations. The major advantage of the video analysis approach is the ability to gather data, non-intrusively, in restricted-access environments, such as emergency and operation rooms, contaminated areas, and control rooms. Video analysis also provides the opportunity to conduct preliminary evaluations of existing work areas.

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96N22893*# ISSUE 7 CATEGORY 54 ***RPT#***: AD-A301047 NIPS-96-30786 ***CNT#***: MIPR-95MM5590 95/09/01 38 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical Fitness Training to Improve the Manual Material Handling Capability of Women ***TLSP***: Annual Report, 23 Jan. - 1 Aug. 1995

AUTHORS: A/Knapik, Joseph

CORP: Army Research Lab., Aberdeen Proving Ground, MD.

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Aerobes/*Females/*Materials Handling/*Physical Fitness

MINS: / Chest/ Data Processing/ Loads (Forces)/ Methylhydrazine/ Muscular Strength

ABA: DTIC

ABSTRACT: This annual report provides preliminary data on a study examining the influence of a combined resistance and aerobic training program on the manual material handling (MMH) capability and road marching performance of female soldiers, subjects were 21 female soldiers, 13 of which completed all phases of the investigation. They trained for 14 weeks, performing progressive resistance training 3 days per week, and running and interval training 2 days per week. Compared to values obtained before training, soldiers increased the maximum mass they could lift from floor to knuckle height by 19% (68 to 81 kg, p less than 0.001) and from floor to chest height by 16% (49 to 57 kg, p less than 0.001). They improved by 17% their ability to lift 15 kg as many times as possible in l0-min (167 to 195 lifts, p less than 0.001). They improved by 4% their maximal effort road march time over a 5 km distance, carrying a 23-kg load mass (44.7 to 43.1 min, p-0.02). Data analysis is still ongoing. These preliminary findings indicate that a short term physical fitness program, conducted about 1 hour per day, 5 days per week can substantially improve female soldier's MMH capability and can result in a small improvement in road marching ability.

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96N16788# ISSUE 4 CATEGORY 52 ***RPT#***: AD-A299596 ***CNT#***: MIPR-95MM5559 95/08/22 13 PAGES UNCLASSIFIED DOCUMENT

TITLE: Neck and back strain profiles of rotary-wing female pilots ***TLSP***: Annual Report

AUTHORS: A/Hodgdon, James A.

CORP: Naval Health Research Center, San Diego, CA.

SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Aerospace Medicine/*Females/*In-Flight Monitoring/*Military Helicopters /*Muscles/*Muscular Fatigue/*Muscular Strength/*Neck (Anatomy)/* Physiological Tests/*Pilot Performance
MINS: / Activation (Biology)/ Asymmetry/ Back Injuries/ Computer Programs/ Electromyography/ Ground Tests/ Muscular Function/ Spine/ Video Signals
ABA: DTIC
ABSTRACT: NHRC has an integrated laboratory and field study to document neck/back fatigue profiles in female military helicopter pilots. Subsequent to a 3-hr flight mission, subjects will undergo initial neck and back strength evaluation using the MedEx. Subsequently, an 8-week neck/back strengthening program will be conducted followed by another neck/back evaluation and 3-hr flight mission. Validation of a repeated jolt impact platform at the U.S. Army Aeromedical Research Laboratory, will also be conducted to ascertain if neck/back muscles fatigue at same rate as in helicopter operations. NHRC has evaluated all equipment and software needed for in-flight monitoring of pilots using portable, miniaturized video/EMG recording systems. Initial analyses of laboratory studies indicate neck strength is greater during rotations to the left. It was observed that lumbar muscle activation is associated with neck fatigue. EMG amplitude asymmetry is evident for both cervical and lumbar paraspinals during extension and flexion suggesting there is uneven strength profiles for neck/back muscles. This asymmetry may be the basis for neck/back fatigue reported by military pilots after prolonged flights. Neck/back strengthening programs may minimize uneven strength profiles and enhance pilot performance in helicopter operations.

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96N10894 ISSUE 1 PAGE 175 CATEGORY 52 ***RPT#***: AD-A296866 NAMRL-MONO-47 ***CNT#***: NR PROJ. M33P-30 95/02/00 54 PAGES UNCLASSIFIED DOCUMENT
TITLE: Occupational strength testing related to gender-neutral issues in naval aviation: A selected bibliography ***TLSP***: Final Report, 1992 - 1994
AUTHORS: A/Luzier, A. R.; B/Erickson, D. G.; C/Mckay, J. R.; D/Baisden, A. G.; E/Pokorski, T. L.
CORP: Naval Aerospace Medical Research Lab., Pensacola, FL.
SAP: Avail: Issuing Activity (Defense Technical Information Center (DTIC))
CIO: UNITED STATES Limited Reproducibility: More Than 20% Of This Document-- May Be Affected By Poor Print
MAJS: /*Aerospace Medicine/*Aircraft Pilots/*Bibliographies/*Females/*Flight Fitness/*Indexes (Documentation)/*Military Aviation/*Muscular Strength/* Physical Fitness/*Pilot Selection
MINS: / Abstracts/ Anthropometry/ Defense Program/ Exercise Physiology/ Navy/ Physical Examinations/ Sex Factor
ABA: DTIC
ABSTRACT: This bibliography presents the results of a literature review to provide background information for the study 'Performance-based Occupational Strength Testing for Candidate Navy Pilots/Naval Flight Officers.' The purpose of this work is to develop an occupational strength test battery to establish gender-neutral standards in naval aviation selection. This research, partially Funded by the Defense Women's Health Research Program, was prompted by a congressional decision to allow smaller statured individuals entry into

military aviation. The long-range objective is to test and identify individuals capable of meeting specific strength requirements to safely operate naval aircraft. The cited publications cover the time period from 1972 through October 1994. The literature search was conducted using the following databases: Defense Technical Information Center (DTIC), Medline, and PsychLit. The abstracts included in this bibliography are in original form. An index organized by subject matter is provided.

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95N18138 ISSUE 5 PAGE 1078 CATEGORY 52 ***RPT#***: AD-A283651 NAMRL-1393 ***CNT#***: DA PROJ. M00-96 94/00/00 19 PAGES UNCLASSIFIED DOCUMENT

TITLE: Effects of weight lifting on intrathoracic pressures generated by anti-g straining maneuvers

AUTHORS: A/Meyer, L. G.; B/Grissett, J. D.; C/Lamberth, J. G.

CORP: Naval Aerospace Medical Research Lab., Pensacola, FL.

SAP: Avail: Issuing Activity (Defense Technical Information Center (DTIC))

CIO: UNITED STATES Limited Reproducibility: More Than 20% Of This Document-- May Be Affected By Microfiche Quality

MAJS: /*Acceleration Tolerance/*Antigravity/*Heart Rate/*Muscles/*Physical Exercise/*Physical Fitness/*Physiological Effects/*Physiological Tests/* Thorax

MINS: / Acceleration Stresses (Physiology)/ Aerospace Medicine/ Lifting Bodies/ Performance Prediction/ Pressure Suits/ Regression Analysis

ABA: DTIC

ABSTRACT: The purpose of this study was to assess the effects of physical fitness program on the ability to perform an anti-G straining maneuver (AGSM). We used mouth-generated intrathoracic pressure (IP) as an index of effectiveness of the AGSM. We compared changes in IP in experimental subjects who performed the AGSM 5 times per week and participated in a weight lifting exercise program to IP's in control subjects who performed the AGSM 10 times per week and did not participate in a weight training program. Initial mean IP's were 169 mmHg and 167 mmHg for the experimental and control groups respectively. After 6 weeks of exercise and AGSM training, mean IP for the experimental subjects was 213 mmHg (26% increase). After 3 weeks of AGSM training, mean IP for the control group was 202 mmHg (21% increase). The difference in pre- and post-IP's between groups was not significant, but both groups significantly increased their IP's with training. Multiple linear regression analysis showed that pulmonary vital capacity and the strength of several muscle groups were significant predictors of IP in the experimental group. We conclude that strength and anaerobic fitness may be important for the performance of an effective AGSM. However, the AGSM training alone appeared to improve the performance of the AGSM as indicated by the increased IP's.

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95N17822# ISSUE 4 CATEGORY 52 94/08/00 4 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT

TITLE: Specific strength diagnostics in long term spaceflight

AUTHORS: A/Tschan, Harald; B/Bachl, N.; C/Baron, R.; D/Koszlovskaya, I. B.; E/Charitonov, N.; F/Mossaheb, Massud; G/Bumba, W.; H/Albrecht, R.; I/Hildebrand, F. ***PAA***: D/(Institute of Biomedical Problems, Moscow, USSR.); E/(Institute of Biomedical Problems, Moscow, USSR.); F/(NOVA, Inc., Vienna, Austria.); G/(Bumba, W. Space Producing, Inc., Vienna,

Austria.); H/(European Southern Observatory, Garching, Germany.); I/(Landessportbund Sachsen, Leipzig, Germany.)

CORP: Wien Univ. (Austria). ***CSS***: (Dept. Sports and Exercise Physiology.)

SAP: Avail: CASI HC A01/MF A04 In ESA, Proceedings of the Fifth European Symposium on Life Sciences Research in Space p 401-404 (SEE N95-17751 04-51)

CIO: Austria Sponsored By Bundesministerium Fuer Wissenschaft Und Forschung--

MAJS: /*Aerospace Medicine/*Diagnosis/*Elbow (Anatomy)/*Gravitational Effects/* Knee (Anatomy)/*Muscles/*Muscular Function/*Muscular Strength/* Weightlessness

MINS: / Exercise Physiology/ Microgravity/ Mir Space Station/ Physical Exercise/ Space Flight Stress

ABA: ESA

ABSTRACT: In order to analyze the strength behavior of knee and elbow extensor and flexor muscles in weightlessness, an electromechanical device (MotoMir) was developed. To quantify the level of static and dynamic strength, maximal isometric, concentric and eccentric contractions had been performed during nine inflight investigations of long term space missions in 1991/1992 (Austro-Russian Cooperative Project) on board of Mir Space Station and had been compared to pre- and post-flight values. The obtained data show that strength-dynamics of lower extremities are following a typical pattern, (marked decrease within the first month of flight followed by an increase of strength in the following months close to preflight baseline values) whereas in upper extremities no phases can be distinguished.

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95N17799# ISSUE 4 CATEGORY 52 94/08/00 5 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT

TITLE: Influence of the gravity vector on early time courses of leg blood flow during calf exercise

AUTHORS: A/Leyk, Dieter; B/Essfeld, D.; C/Baum, Klaus; D/Stegemann, Juergen

CORP: Deutsche Sporthochschule, Cologne (Germany). ***CSS***: (Dept. of Physiology.)

SAP: Avail: CASI HC A01/MF A04 In ESA, Proceedings of the Fifth European Symposium on Life Sciences Research in Space p 275-279 (SEE N95-17751 04-51)

CIO: Germany--

MAJS: /*Blood Flow/*Exercise Physiology/*Gravitational Effects/*Gravitational Physiology/*Hemodynamic Responses/*Leg (Anatomy)/*Muscular Strength/* Peripheral Circulation/*Physical Exercise

MINS: / Blood Pressure/ Cardiovascular System/ Heart Rate/ Human Body/ Muscles/ Posture/ Weightlessness

ABA: ESA

ABSTRACT: Dynamic exercise immediately affects peripheral blood flow. The influence of the following parameters on arterial blood velocity during calf muscle exercise in ground is investigated: number of contractions, strength of contraction, and body position. The combination of single, light contractions in the tilt posture is used as a ground model for weightlessness. The supine blood flow parameters in the arteria femoralis were significantly higher than in the upright position. The major part of the blood flow response to exercise always occurred during the first 10 s at virtually unchanged blood pressures. In the upright position, the computed blood flow during this period increased 2.52 fold (5% MVC) and 2.95 fold (25% MVC). The corresponding values in the tilted sitting position were 1.67 and

1.84. The increase in the upright position is too large to be attributed only to the increase of the perfusion pressure caused by the reduction of the hydrostatic pressure on the venous side. Therefore, decreases in local resistance appear to play an additional role. In the supine position where hydrostatic effects on peripheral perfusion are negligible, only effects on local resistance can account for the early increase of blood flow. Due to this effect and the increased resting perfusion, the absolute values of blood flow during light dynamic exercise in weightlessness could be even higher than in the upright posture on ground.

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95N15139*# ISSUE 3 PAGE 549 CATEGORY 52 93/02/00 2 PAGES UNCLASSIFIED DOCUMENT

TITLE: A method for continuous monitoring of the Ground Reaction Force during daily activity

AUTHORS: A/Whalen, Robert; B/Quintana, Jason; C/Emery, Jeff

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

SAP: Avail: CASI HC A01/MF A02 In International Union of Physiological Sciences, The Physiologist, Volume 36, Number 1, Supplement 2 p (SEE N95-15089 03-52)

CIO: United States--

MAJS: /*Activity Cycles (Biology)/*Aerospace Medicine/*Bones/*Loads (Forces)/* Mathematical Models/*Muscular Strength/*Physical Exercise/*Strain Rate

MINS: / Algorithms/ Flux Density/ Running/ Walking

ABA: Author

ABSTRACT: Theoretical models and experimental studies of bone remodeling have identified peak cyclic force levels (or cyclic tissue strain energy density), number of daily loading cycles, and load (strain) rate as possible contributors to bone modeling and remodeling stimulus. To test our theoretical model and further investigate the influence of mechanical forces on bone density, we have focused on the calcaneus as a model site loaded by calcaneal surface tractions which are predominantly determined by the magnitude of the external ground reaction force (GRF).

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95N15136*# ISSUE 3 PAGE 548 CATEGORY 52 93/02/00 4 PAGES UNCLASSIFIED DOCUMENT

TITLE: Musculoskeletal adaptation to mechanical forces on Earth and in space

AUTHORS: A/Whalen, Robert

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

SAP: Avail: CASI HC A01/MF A02 In International Union of Physiological Sciences, The Physiologist, Volume 36, Number 1, Supplement 4 p (SEE N95-15089 03-52)

CIO: United States--

MAJS: /*Adaptation/*Aerospace Medicine/*Gravitational Physiology/*Loads (Forces) /*Long Duration Space Flight/*Lower Body Negative Pressure/*Mathematical Models/*Muscular Strength/*Musculoskeletal System/*Physical Exercise/* Space Programs

MINS: / Astronauts/ Bone Mineral Content/ Cosmonauts/ Health/ Locomotion/ Safety Factors

ABA: Author (revised)

ABSTRACT: A major concern of the US and Russian space programs is the health and safety of astronauts and cosmonauts. One of the areas receiving the most attention has been the

effects of long duration space flight on the musculoskeletel system. After three decades of space flight and research, questions continue. Can exercise in space maintain musculoskeletal tissue mass and function in an adult? The objective of this paper is to address this question in a way that hopefully provides a rational basis for quantifying and evaluating the influnence of daily activities on muscle and bone on Earth and in space.

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95N11608 ISSUE 1 PAGE 147 CATEGORY 52 94/00/00 8 PAGES UNCLASSIFIED DOCUMENT DCAF F072070 COPYRIGHT

TITLE: Strength training as a counter-measure for microgravity effects

AUTHORS: A/Forsyth, R. D.; B/Plyley, M. J.; C/Rhodes, W. R.; D/Mckee, N.; E/Hartley, J.

CORP: Toronto Univ. (Ontario). ***CSS***: (School of Physical and Health Education.)

SAP: Avail: Issuing Activity (Centre for Northern Studies and Research, McGill Univ., 805 Sherbrooke Street West, Montreal, Quebec, H3A 2K6, Canada) In McGill Univ., Second International Design for Extreme Environment Assembly (IDEEA Two). Growth and Environment: Challenging Extreme Frontiers p 223-230 (SEE N95-11600 01-54)

CIO: Canada--

MAJS: /*Bioastronautics/*Bones/*Education/*Long Term Effects/*Microgravity/* Muscles/*Physical Exercise/*Space Stations/*Spacecraft Environments

MINS: / Atrophy/ Degradation/ Guy Wires/ Health/ Human Factors Engineering/ Priorities/ Spacecrews

ABA: Author

ABSTRACT: Our team has been investigating the utility of exercise as a counter-measure to the effects of microgravity on muscle and bone. Though our research is still incomplete, our preliminary findings show that muscle force strength can be maintained by isometric exercise. The results of past research support the hypothesis that exercise can be useful as a counter-measure to the effects of microgravity. However, much research needs to be carried out to investigate the type, amount and nature of this exercise. Furthermore, techniques and approaches to supplying this exercise in space station or spacecraft environment must be well researched before being committed to a particular space program. Weight, size and simplicity of operation are major design constraints that must drive the hardware and software development for such an exercise system. The body's response to long term microgravity effects include many physiological changes. Bone determination and muscle atrophy are two of these changes. This presentation deals with the effects of microgravity on bone and muscle composition, and the way in which exercise can alleviate these problems. The authors of this presentation propose that the methods for controlling the effects of microgravity on bone and muscle must be developed now. Research must be focussed on of whether the effects of microgravity on bone degradation are permanent or are reversible. The health and well being of humans returning from extended stays in space must be a top priority. Hence, this presentation describes a proposed system for use in space to reduce or eliminate the effects of microgravity on human bone and muscle tissue. Our presentation will look at the history of exercise systems used for counter-acting microgravity. We will illustrate the strengths and weaknesses we perceive as important to the development of such systems. We will examine the physiological processes and consequences of exercise in microgravity. Finally, we will outline proposed methods and techniques that could be used on the space station and for space-craft bound for Mars.

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94N28757# ISSUE 8 PAGE 3388 CATEGORY 52 ***RPT#***: AD-A275901 USAARL-94-4 ***CNT#***: DA PROJ. 3M1-62787-A-879 94/01/00 26 PAGES UNCLASSIFIED DOCUMENT

TITLE: Aviation epidemiology data register: Age distribution of U.S. Army aviators stratified by gender and component of service ***TLSP***: Final Report

AUTHORS: A/Mason, Kevin T.; B/Shannon, S. G.

CORP: Army Aeromedical Research Lab., Fort Rucker, AL.

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Aging (Biology)/*Aircraft Pilots/*Data Bases/*Epidemiology/*Flight Crews

MINS: / Aerospace Medicine/ Health/ Physical Fitness/ Physiology

ABA: DTIC

ABSTRACT: The U.S. Army Aviation Epidemiology Data Register (AEDR) contains information on the history and physical parameters of Army aircrew members. As a reference for AEDR users and customers, the age distribution of Army aviators was extracted. The data were tabulated by age, gender, and component of service for calendar years 1986 through 1992. AEDR researchers can use the tables to calculate annual incidence rates, annual period prevalence rates, and other rates based on aviator-years of occupational exposure stratified by age, gender, and/or component. Aeromedical resource, policy and standards managers can use the tables for planning and funding aviator health care programs.

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94N28374*# ISSUE 7 PAGE 2936 CATEGORY 52 94/02/00 9 PAGES UNCLASSIFIED DOCUMENT

TITLE: Psychophysiology in microgravity and the role of exercise

AUTHORS: A/Shaw, J. M.; B/Hackney, A. C.

CORP: North Carolina Univ., Chapel Hill, NC. ***CSS***: (Exercise Physiology Lab.)

SAP: Avail: CASI HC A02/MF A03 In NASA. Johnson Space Center, Workshop on Countering Space Adaptation with Exercise: Current Issues p 205-213 (SEE N94-28361 07-52)

CIO: United States--

MAJS: /*Long Duration Space Flight/*Microgravity/*Physical Exercise/* Psychophysiology/*Spacecrews

MINS: / Chronic Conditions/ Health/ Physiological Effects/ Psychological Factors / Space Station Freedom/ Weightlessness/ Work-Rest Cycle

ABA: Author (revised)

ABSTRACT: The Space Transportation-Shuttle (STS) Program has greatly expanded our capabilities in space by allowing for missions to be flown more frequently, less expensively, and to encompass a greater range of goals than ever before. However, the scope of the United State's role and involvement in space is currently at the edge of a new and exciting era. The National Aeronautics and Space Administration (NASA) has plans for placing an orbiting space station (Space Station Freedom) into operation before the year 2000. Space Station Freedom promises to redefine the extent of our involvement in space even further than the STS program. Space Station crewmembers will be expected to spend extended periods of time (approximately 30 to 180 days) in space exposed to an extremely diverse and adverse environment (e.g., the major adversity being the chronic microgravity condition). Consequently, the detrimental effects of exposure to the microgravity

environment is of primary importance to the biomedical community responsible for the health and well-being of the crewmembers. Space flight and microgravity exposure present a unique set of stressors for the crewmember; weightlessness, danger, isolation/confinement, irregular work-rest cycles, separation from family/friends, and mission/ground crew interrelationships. A great deal is beginning to be known about the physiological changes associated with microgravity exposure, however, limited objective psychological findings exist. Examination of this latter area will become of critical concern as NASA prepares to place crewmembers on the longer space missions that will be required on Space Station Freedom. Psychological factors, such as interpersonal relations will become increasingly important issues, especially as crews become more heterogeneous in the way of experience, professional background, and assigned duties. In an attempt to minimize the detrimental physiological effects of prolonged space flight and microgravity exposure, the United States and Russian space agencies have taken steps to implement various countermeasure programs. One of the principle countermeasures used by both nations is exercise during space flight. The purpose is to present a brief overview of the major research findings examining the psychophysiological changes associated with microgravity exposure, and to address the potential role of exercise as a countermeasure in affecting these psychophysiological changes.

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94N28372*# ISSUE 7 PAGE 2936 CATEGORY 52 94/02/00 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: The value of electrical stimulation as an exercise training modality

AUTHORS: A/Currier, Dean P.; B/Ray, J. Michael; C/Nyland, John; D/Noteboom, Tim

CORP: Kentucky Univ., Lexington, KY. ***CSS***: (Dept. of Physical Therapy.)

SAP: Avail: CASI HC A01/MF A03 In NASA. Johnson Space Center, Workshop on Countering Space Adaptation with Exercise: Current Issues p 187-191 (SEE N94-28361 07-52)

CIO: United States--

MAJS: /*Contraction/*Healing/*Human Body/*Muscular Strength/*Neuromuscular Transmission/*Physical Exercise/*Stimulation

MINS: / Bones/ Connective Tissue/ Muscles/ Pain/ Physiological Responses

ABA: Author (revised)

ABSTRACT: Voluntary exercise is the traditional way of improving performance of the human body in both the healthy and unhealthy states. Physiological responses to voluntary exercise are well documented. It benefits the functions of bone, joints, connective tissue, and muscle. In recent years, research has shown that neuromuscular electrical stimulation (NMES) simulates voluntary exercise in many ways. Generically, NMES can perform three major functions: suppression of pain, improve healing of soft tissues, and produce muscle contractions. Low frequency NMES may gate or disrupt the sensory input to the central nervous system which results in masking or control of pain. At the same time NMES may contribute to the activation of endorphins, serotonin, vasoactive intestinal polypeptides, and ACTH which control pain and may even cause improved athletic performances. Soft tissue conditions such as wounds and inflammations have responded very favorably to NMES. NMES of various amplitudes can induce muscle contractions ranging from weak to intense levels. NMES seems to have made its greatest gains in rehabilitation where directed muscle contractions may improve joint ranges of motion correct joint contractures that result from shortening muscles; control abnormal movements through facilitating recruitment or

excitation into the alpha motoneuron in orthopedically, neurologically, or healthy subjects with intense sensory, kinesthetic, and proprioceptive information; provide a conservative approach to management of spasticity in neurological patients; by stimulation of the antagonist muscle to a spastic muscle stimulation of the agonist muscle, and sensory habituation; serve as an orthotic substitute to conventional bracing used with stroke patients in lieu of dorsiflexor muscles in preventing step page gait and for shoulder muscles to maintain glenohumeral alignment to prevent subluxation; and of course NMES is used in maintaining or improving the performance or torque producing capability of muscle. NMES in exercise training is our major concern.

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94N28371*# ISSUE 7 PAGE 2935 CATEGORY 52 94/02/00 9 PAGES UNCLASSIFIED DOCUMENT

TITLE: Electrical stimulation in exercise training

AUTHORS: A/Kroll, Walter

CORP: Massachusetts Univ., Amherst, MA. ***CSS***: (Dept. of Exercise Science.)

SAP: Avail: CASI HC A02/MF A03 In NASA. Johnson Space Center, Workshop on Countering Space Adaptation with Exercise: Current Issues p 183-186 (SEE N94-28361 07-52)

CIO: United States--

MAJS: /*Electric Stimuli/*Electrophysiology/*Muscles/*Physiological Responses/* Stimulation

MINS: / Athletes/ Atrophy/ Exercise Physiology/ Muscular Strength/ Physical Exercise

ABA: Author

ABSTRACT: Electrical stimulation has a long history of use in medicine dating back to 46 A.D. when the Roman physician Largus found the electrical discharge of torpedo fishes useful in the treatment of pain produced by headache and gout. A rival Greek physician, Dioscorides, discounted the value of the torpedo fish for headache relief but did recommend its use in the treatment of hemorrhoids. In 1745, the Leyden jar and various sized electrostatic generators were used to treat angina pectoris, epilepsy, hemiplegia, kidney stones, and sciatica. Benjamin Franklin used an electrical device to treat successfully a young woman suffering from convulsive fits. In the late 1800's battery powered hydroelectric baths were used to treat chronic inflammation of the uterus while electrified athletic supporters were advertised for the treatment of male problems. Fortunately, such an amusing early history of the simple beginnings of electrical stimulation did not prevent eventual development of a variety of useful therapeutic and rehabilitative applications of electrical stimulation. Over the centuries electrical stimulation has survived as a modality in the treatment of various medical disorders with its primary application being in the rehabilitation area. Recently, a surge of new interest in electrical stimulation has been kindled by the work of a Russian sport scientist who reported remarkable muscle strength and endurance improvements in elite athletes. Yakov Kots reported his research on electric stimulation and strength improvements in 1977 at a Canadian-Soviet Exchange Symposium held at Concordia University in Montreal. Since then an explosion of new studies has been seen in both sport science and in medicine. Based upon the reported works of Kots and the present surge of new investigations, one could be misled as to the origin of electrical stimulation as a technique to increase muscle strength. As a matter of fact, electric stimulation has been used as a technique to improve muscle strength for over a century. Bigelow reported in 1894, for example, the use of electrical stimulation on a young man for the purpose of increasing muscle strength. Employing a rapidly alternating sinusoidal induced current and

a dynamometer for strength testing, Bigelow reported that the total lifting capacity of a patient increased from 4328 pounds to 4639 pounds after only 25 minutes of stimulation. In 1965, Massey et al. reported on the use of an Isotron electrical stimulator that emitted a high frequency current. Interestingly enough, the frequencies used by Massey et al. and the frequencies used by Bigelow in 1894 were in the same range of frequencies reported by Kots as being the most effective in strength development. It would seem the Russian secret of high frequency electrical stimulation for strength development, then, is not a modern development at all.

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94N28363*# ISSUE 7 PAGE 2934 CATEGORY 52 94/02/00 12 PAGES UNCLASSIFIED DOCUMENT

TITLE: Eccentric exercise testing and training

AUTHORS: A/Clarkson, Priscilla M.

CORP: Massachusetts Univ., Amherst, MA. ***CSS***: (Dept. of Exercise Science.)

SAP: Avail: CASI HC A03/MF A03 In NASA. Johnson Space Center, Workshop on Countering Space Adaptation with Exercise: Current Issues p 99-110 (SEE N94-28361 07-52)

CIO: United States--

MAJS: /*Contraction/*Injuries/*Muscles/*Physical Exercise/*Physiology

MINS: / Education/ Microgravity/ Walking

ABA: Author (revised)

ABSTRACT: Some researchers and practitioners have touted the benefits of including eccentric exercise in strength training programs. However, others have challenged its use because they believe that eccentric actions are dangerous and lead to injuries. Much of the controversy may be based on a lack of understanding of the physiology of eccentric actions. This review will present data concerning eccentric exercise in strength training, the physiological characteristics of eccentric exercise, and the possible stimulus for strength development. Also a discussion of strength needs for extended exposure to microgravity will be presented. Not only is the use of eccentric exercise controversial, but the name itself is fraught with problems. The correct pronunciation is with a hard ‘c’ so that the word sounds like ekscentric. The confusion in pronunciation may have been prevented if the spelling that Asmussen used in 1953, excentric, had been adopted. Another problem concerns the expressions used to describe eccentric exercise. Commonly used expressions are negatives, eccentric contractions, lengthening contractions, resisted muscle lengthenings, muscle lengthening actions, and eccentric actions. Some of these terms are cumbersome (i.e., resisted muscle lengthenings), one is slang (negatives), and another is an oxymoron (lengthening contractions). Only eccentric action is appropriate and adoption of this term has been recommended by Cavanagh. Despite the controversy that surrounds eccentric exercise, it is important to note that these types of actions play an integral role in normal daily activities. Eccentric actions are used during most forms of movement, for example, in walking when the foot touches the ground and the center of mass is decelerated and in lowering objects, such as placing a bag of groceries in the car.

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94N23575*# ISSUE 6 PAGE 2426 CATEGORY 52 ***RPT#***: NASA-TM-108778 A-93091 NAS 1.15:108778 ***CNT#***: RTOP 199-18-12-07 93/11/00 167 PAGES UNCLASSIFIED DOCUMENT

TITLE: Exercise, exercise training, and the immune system. A compendium of research (1902-1991)

AUTHORS: A/Hardesty, A. J.; B/Greenleaf, J. E.; C/Simonson, S.; D/Hu, A.; E/Jackson, C. G. R. ***PAA***: C/(University of Northern Colorado, Greeley.); D/(University of Northern Colorado, Greeley.); E/(University of Northern Colorado, Greeley.)

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

SAP: Avail: CASI HC A08/MF A02

CIO: United States--

MAJS: /*Exercise Physiology/*Immune Systems/*Immunology/*Physical Exercise/* Physiological Effects

MINS: / Fatigue (Biology)/ Leukocytes/ Lymphocytes/ Sports Medicine/ Stress (Physiology)

ABA: Author (revised)

ABSTRACT: This compendium includes abstracts and synopses of clinical observations and of more basic studies involving physiological mechanisms concerning interaction of physical exercise and the human immune system. If the author's abstract or summary was appropriate, it was included. In other cases, a more detailed synopsis of the paper was prepared under the subheadings 'Purpose,' 'Methods,' 'Results,' and 'Conclusions.' Author and subject indices are provided, plus a selected bibliography of related work or those papers received after the volume was being prepared for publication. This volume includes material published from 1902 through 1991.

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94N23530*# ISSUE 6 PAGE 2426 CATEGORY 52 ***RPT#***: NASA-TP-3346 NAS 1.60:3346 93/03/00 36 PAGES UNCLASSIFIED DOCUMENT

TITLE: Responses to LBNP in men with varying profiles of strength and aerobic capacity: Implications for flight crews ***TLSP***: Technical Paper, Jul. 1985 - Apr. 1986

AUTHORS: A/Convertino, Victor A.; B/Mathes, Karen L.; C/Lasley, Mary L.; D/Tomaselli, Clare Marie; E/Frey, Mary Anne Bassett; F/Hoffler, G. Wyckliffe ***PAA***: B/(Krug International, Houston, TX.); C/(Bionetics Corp., Cocoa Beach, FL.); D/(John B. Pierce Foundation of Connecticut, New Haven.); E/(Lockheed Engineering and Sciences Co., Washington, DC.)

CORP: National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Cardiac Output/*Cardiovascular System/*Exercise Physiology/* Gravitational Physiology/*Head Down Tilt/*Lower Body Negative Pressure/* Microgravity/*Muscular Strength

MINS: / Physiological Responses/ Weightlessness Simulation

ABA: Author

ABSTRACT: Hemodynamic and hormonal responses to lower-body negative pressure (LBNP) were examined in 24 healthy men to test the hypothesis that responsiveness of reflex control of blood pressure during orthostatic stress is associated with strength and/or aerobic capacity. Subjects underwent treadmill tests to determine peak oxygen uptake (peak VO2) and isokinetic dynamo meter tests to determine leg strength. Based on predetermined criteria, the subjects were classified into one of four fitness profiles of six subjects each

matched for age, height, and weight: (1) low strength/low aerobic fitness; (2) low strength/high aerobic fitness; (3) high strength/low aerobic fitness; and (4) high strength/high aerobic fitness. Following 90 min of 6 degree head-down tilt (HDT), each subject underwent graded LBNP through -50 mmHg or presyncope, with maximal duration 15 min. All groups exhibited typical hemodynamic, hormonal, and fluid shift responses during LBNP, with no intergroup differences except for catecholamines. Seven subjects, distributed among the four fitness profiles, became presyncopal. Subjects who showed greatest reduction in mean arterial pressure (MAP) during LBNP had greater elevations in vasopressin and lesser increases in heart rate and peripheral resistance. Peak VO2 nor leg strength were correlated with fall in MAP or with syncopal episodes. We conclude that neither aerobic nor strength fitness characteristics are good predictors of responses to LBNP stress.

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94N21036# ISSUE 5 PAGE 1892 CATEGORY 52 ***RPT#***: AD-A271642 USARIEM-T94-2 93/10/00 70 PAGES UNCLASSIFIED DOCUMENT

TITLE: Maximum team lifting capacity as a function of team size

AUTHORS: A/Sharp, Marilyn A.; B/Rice, Valerie J.; C/Nindl, Bradley C.; D/Williamson, Tania L.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA.

SAP: Avail: CASI HC A04/MF A01

CIO: United States--

MAJS: /*Exercise Physiology/*Human Performance/*Loads (Forces)/*Muscular Strength/*Physical Fitness

MINS: / Bivariate Analysis/ Females/ Males/ Mean/ Standard Deviation

ABA: DTIC

ABSTRACT: The relationship between the sum of individual lifts and team lifting capacity in two-, three-, and four-person teams was examined. Twenty-three men and 17 women were assigned to single and mixed-gender teams of two, three, or four persons. A weight-lifting bar was used to measure individual deadlift, as square device for two- and four-person lifting and a triangular device for three-person lifting. Team lifting capacity increased with team size and with the number of males on the team. Team lifting capacity as a percent of the sum of deadlift strength (% sum) did not change with an increase in team size beyond two. The %sum for teams of men (87.3%) was less than for teams of women (91.1%, p less than .05), and the %sums for single gender teams were both greater (p less than .01) than for mixed-gender teams (80.2%). The limits for lift set by Military Standard 1472D (1989) are well below the capabilities demonstrated here, and there is ample evidence in the Military Occupational Classification Structure (1990) that soldiers are required to lift heavier loads than recommended. Since soldiers are capable of and required to lift more than the recommended loads, consideration could be given to increasing these design limits.

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94N16636*# ISSUE 3 PAGE 1127 CATEGORY 52 93/07/00 3 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical Exercise Program

CORP: National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SAP: Avail: CASI HC A01/MF A03 In BioTechnology, Inc., Proceedings of the 1992 Annual Meeting NASA Occupational Health Program p 255-257 (SEE N94-16609 03-52)
CIO: United States--
MAJS: /*Facilities/*Health/*Nasa Programs/*Physical Exercise/*Physical Fitness
MINS: / Education/ Prevention
ABA: CASI
ABSTRACT: The topics discussed include the following: the Marshall Space Flight Center Physical Education Program and the physical fitness and health breakout session.

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94N16635*# ISSUE 3 PAGE 1126 CATEGORY 52 93/07/00 5 PAGES UNCLASSIFIED DOCUMENT
TITLE: The Langley Fitness Center
CORP: National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SAP: Avail: CASI HC A01/MF A03 In BioTechnology, Inc., Proceedings of the 1992 Annual Meeting NASA Occupational Health Program p 249-253 (SEE N94-16609 03-52)
CIO: United States--
MAJS: /*Facilities/*Health/*Nasa Programs/*Personnel/*Physical Exercise/* Productivity
MINS: / Diseases/ Prevention/ Sicknesses
ABA: Derived from text
ABSTRACT: NASA Langley recognizes the importance of healthy employees by committing itself to offering a complete fitness program. The scope of the program focuses on promoting overall health and wellness in an effort to reduce the risks of illness and disease and to increase productivity. This is accomplished through a comprehensive Health and Fitness Program offered to all NASA employees. Various aspects of the program are discussed.

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94N16634*# ISSUE 3 PAGE 1126 CATEGORY 52 93/07/00 4 PAGES UNCLASSIFIED DOCUMENT
TITLE: Kennedy Space Center exercise program
AUTHORS: A/Hoffman, Cristy
CORP: Bionetics Corp., Cocoa Beach, FL.
SAP: Avail: CASI HC A01/MF A03 In BioTechnology, Inc., Proceedings of the 1992 Annual Meeting NASA Occupational Health Program p 245-248 (SEE N94-16609 03-52)
CIO: United States--
MAJS: /*Facilities/*Health/*Nasa Programs/*Operations Research/*Physical Exercise
MINS: / Contractors/ Personnel
ABA: Derived from text
ABSTRACT: The Kennedy Space Center (KSC) Fitness Program began in Feb. 1993. The program is managed by the Biomedical Operations and Research Office and operated by the Bionetics Corporation. The facilities and programs are offered to civil servants, all contractors, temporary duty assignment (TDY) participants, and retirees. All users must first have a medical clearance. A computer-generated check-in system is used to monitor participant usage. Various aspects of the program are discussed.

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94N16633*# ISSUE 3 PAGE 1126 CATEGORY 52 93/07/00 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: Johnson Space Center health related fitness program

AUTHORS: A/Wier, Larry T.

CORP: National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

SAP: Avail: CASI HC A01/MF A03 In BioTechnology, Inc., Proceedings of the 1992 Annual Meeting NASA Occupational Health Program p 239-243 (SEE N94-16609 03-52)

CIO: United States--

MAJS: /*Education/*Facilities/*Health/*Nasa Programs/*Physical Exercise

MINS: / Nutrition/ Personnel

ABA: CASI

ABSTRACT: The topics covered include the following: educational component; activity ratings; lecture topics; program evaluation; Nutrition Intervention Program; and research.

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94N16631*# ISSUE 3 PAGE 1126 CATEGORY 52 93/07/00 3 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical fitness and health education program at NASA Headquarters

AUTHORS: A/Angotti, Cathy

CORP: National Aeronautics and Space Administration, Washington, DC.

SAP: Avail: CASI HC A01/MF A03 In BioTechnology, Inc., Proceedings of the 1992 Annual Meeting NASA Occupational Health Program p 233-235 (SEE N94-16609 03-52)

CIO: United States--

MAJS: /*Education/*Health/*Medical Services/*Nasa Programs/*Physical Fitness/* Project Management

MINS: / Policies/ Procedures

ABA: Derived from text

ABSTRACT: The topics discussed include the following: policy procedures to enter the NASA Headquarters Physical Fitness and Health Program; eligibility; TDY eligibility; health promotions offered; and general facility management.

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94N16609*# ISSUE 3 PAGE 1123 CATEGORY 52 ***RPT#***: NASA-CR-193462 NAS 1.26:193462 ***CNT#***: NASW-4176 93/07/00 312 PAGES UNCLASSIFIED DOCUMENT

TITLE: Proceedings of the 1992 Annual Meeting NASA Occupational Health Program

CORP: BioTechnology, Inc., Falls Church, VA.

SAP: Avail: CASI HC A14/MF A03

CIO: United States Meeting Held In San Jose, Ca, 30 Nov. - 4 Dec. 1992--

MAJS: /*Conferences/*Diseases/*Education/*Epidemiology/*Facilities/*Health/* Medical Services/*Nasa Programs/*Occupational Diseases/*Personnel/* Physical Fitness/*Toxic Hazards

MINS: / Asbestos/ Cancer/ Hepatitis/ Human Factors Engineering/ Human Immunodeficiency Virus/ Lead Poisoning/ Medical Equipment/ Safety Management

ANN: The purpose of this meeting was to exchange information across NASA facilities that is critical to agency-wide improvement in the efforts to maintain and enhance employee

health. The topics covered include the following: occupational medicine, environmental health, physical fitness, and health education. For individual titles, see N94-16610 through N94-16645.

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94N11191*# ISSUE 1 PAGE 300 CATEGORY 51 ***RPT#***: NASA-TM-103987 A-93008 NAS 1.15:103987 ***CNT#***: RTOP 199-21-12-07 93/06/00 216 PAGES UNCLASSIFIED DOCUMENT

TITLE: Exercise countermeasures for bed-rest deconditioning ***TLSP***: Final Report, 1986

AUTHORS: A/Greenleaf, John ***PAT***: A/ed.

CORP: National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

SAP: Avail: CASI HC A10/MF A03

CIO: United States--

MAJS: /*Aerospace Medicine/*Bed Rest/*Countermeasures/*Deconditioning/* Isotonicity/*Maintenance Training/*Muscular Strength/*Orthostatic Tolerance/*Oxygen Metabolism/*Physical Exercise/*Physiological Effects/* Weightlessness Simulation

MINS: / Atrophy/ Bones/ Endocrinology/ Gas Exchange/ Gravitational Physiology/ Muscles/ Posture/ Work Capacity

ABA: Author (revised)

ABSTRACT: The purpose for this 30-day bed rest study was to investigate the effects of short-term, high intensity isotonic and isokinetic exercise training on maintenance of working capacity (peak oxygen uptake), muscular strength and endurance, and on orthostatic tolerance, posture and gait. Other data were collected on muscle atrophy, bone mineralization and density, endocrine analyses concerning vasoactivity and fluid-electrolyte balance, muscle intermediary metabolism, and on performance and mood of the subjects. It was concluded that: The subjects maintained a relatively stable mood, high morale, and high esprit de corps throughout the study. Performance improved in nearly all tests in almost all the subjects. Isotonic training, as opposed to isokinetic exercise training, was associated more with decreasing levels of psychological tension, concentration, and motivation; and improvement in the quality of sleep. Working capacity (peak oxygen uptake) was maintained during bed rest with isotonic exercise training; it was not maintained with isokinetic or no exercise training. In general, there was no significant decrease in strength or endurance of arm or leg muscles during bed rest, in spite of some reduction in muscle size (atrophy) of some leg muscles. There was no effect of isotonic exercise training on orthostasis, since tilt-table tolerance was reduced similarly in all three groups following bed rest. Bed rest resulted in significant decreases of postural stability and self-selected step length, stride length, and walking velocity, which were not influenced by either exercise training regimen. Most pre-bed rest responses were restored by the fourth day of recovery.

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93N32256# ISSUE 12 PAGE 3780 CATEGORY 54 93/03/00 4 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

TITLE: Correlation of life-style and dietary concomitants of Greek pilots with serum analytes

AUTHORS: A/Daskalopoulos, C.; B/Palermos, J.; C/Zoga, T.; D/Stavropoulos, A.; E/Kyriakos, K.

CORP: Hellenic Air Force General Hospital, Athens (Greece).
SAP: Avail: CASI HC A01/MF A03 In AGARD, Nutrition, Metabolic Disorders and Lifestyle of Aircrew 4 p (SEE N93-32240 12-54)
CIO: Greece--
MAJS: /*Anthropometry/*Carbohydrates/*Cholesterol/*Diets/*Heart Diseases/*Serums
MINS: / Food Intake/ Health/ Physical Exercise
ABA: Author (revised)
ABSTRACT: Certain serum analytes (glucose, total cholesterol, HDL cholesterol, triglycerides, uric acid, and y-glutamyltransferase) were correlated with some lifestyle variables (dietary features, anthropometrics, and physical exercise) in military (n=157) and civilian (n=157) male pilots in order to determine a possible relationship between these variables and their health status. The subjects, randomly selected within a certain period, were currently active without any history of coronary heart disease or diabetes mellitus and were not receiving any medication. In total, military pilots had statistically significant increased mean values of glucose, while a correlation of the mean values between groups with similar age showed that military pilots had increased cholesterol values and civilian pilots had increased triglycerides, LDL cholesterol, and y-GT values. Both had an average body mass index (weight/height(sup 2)) of 25 and very few of them were following an effective physical exercise program toward lowering cholesterol level. They preferred taking few (82.1 percent, 80.9 percent for military and civilian pilots respectively) but large meals (59.2 percent, 52.2 percent respectively). Concerning food composition, almost 30 percent of them were eating meals containing 38 percent or more fat, and 15 percent of them were eating meals with less than 44 percent carbohydrates of total daily caloric intake. Finally, our data suggest that: (1) the concentration of certain blood analytes (glucose, cholesterol) should be reduced, (2) an effective regular aerobic exercise program should be followed, and (3) meals should be altered toward the pattern of 'many and small' per day containing less fat and more carbohydrates.

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93N26229# ISSUE 9 PAGE 2802 CATEGORY 54 ***RPT#***: AD-A261059 NHRC-92-26 92/09/29 20 PAGES UNCLASSIFIED DOCUMENT
TITLE: Combined strength and endurance training: Functional and morphological adaptations to ten weeks of training ***TLSP***: Final Report, May - Sep. 1991
AUTHORS: A/Mccarthy, J.; B/Griffith, P.; C/Prusaczyk, W. K.; D/Goforth, H. W., Jr.; E/Vailas, A.
CORP: Naval Health Research Center, San Diego, CA.
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Endurance/*Exercise Physiology/*Physical Exercise/*Physical Fitness
MINS: / Anthropometry/ Body Weight/ Flexors/ Heart Rate/ Histology/ Males/ Muscles/ Muscular Strength/ Thigh
ABA: DTIC
ABSTRACT: The literature suggests that muscular strength development can be inhibited when endurance and strength training programs are combined. The purpose of this study was to examine the effects of strength and endurance training programs, individually and in combination, on performance changes and associated muscle adaptations. Sedentary males (n=30) were randomly assigned to one of three training groups: strength-only (STR),

endurance-only (END), or combined strength and endurance (COM). Subjects trained three days per week for ten weeks. Strength training consisted of select upper and lower body resistance exercises (three maximal effort sets, five to seven repetitions per set). Endurance training consisted of continuous cycling for 50 min at 70% heart rate reserve (HRR). Subjects in COM engaged in both the strength and endurance training programs on the same day. Anthropometric characteristics, strength, and peak oxygen uptake (cycling) were measured; biopsies were taken from the vastus lateralis muscle; and computed tomography (CT) scans were performed on mid-thigh before and after ten weeks of training. Groups STR and COM showed significant (p less than 0.05) increases ***In***: one-repetition maximum squat (23%, 22%) and bench press (18%, 18%); vertical jump (6%, 9%); lean body weight (3%, 5%); mid-thigh girth (3%, 4%); fast twitch (FT) muscle fiber area (24%, 28%); mean muscle fiber area (21%, 23%); thigh extensor (12%, 14%) and flexor (7%, 6%) areas. All groups exhibited significant increases in peak oxygen uptake following training END (18%), COM (16%), and STR (9%). These results suggest that combining strength and endurance training programs can produce significant concurrent gains in muscular strength and power, muscle hypertrophy, and peak oxygen uptake.

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92N30216# ISSUE 20 PAGE 3510 CATEGORY 52 ***RPT#***: AD-A250649 NHRC-91-31 91/11/19 44 PAGES UNCLASSIFIED DOCUMENT

TITLE: Exercise and three psychosocial variables: A longitudinal study ***TLSP***: Final Report

AUTHORS: A/Stevens, Linda; B/Conway, Terry L.

CORP: Naval Health Research Center, San Diego, CA.

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Demography/*Education/*Health/*Personnel/*Physical Exercise/* Psychological Factors/*Psychology/*Social Factors

MINS: / Evaluation/ Exercise Physiology/ Females/ Males/ Navy/ Quality

ABA: DTIC

ABSTRACT: A predominant opinion in research and society today maintains that exercise is beneficial for the reduction of depression and enhancement of self-esteem and quality of life. Yet, controversy still exists over the populations in which these phenomena occur. The purpose of this study was to identify in whom, when, and where exercise participation (EX) has significant effects on depression (DEP), self-esteem (SE), and quality of life (QOL). Data were collected on 1,292 male and female, active-duty Navy personnel in 1988 and 1989 as part of an on-going evaluation of the Navy's Health and Physical Readiness Program. Pearson's product-moment correlations revealed that EX was significantly related cross-sectionally to DEP, SE, and QOL, in the expected directions, at two separate points in time. Correlations among residualized gain scores revealed that changes in EX were significantly, negatively related to changes in DEP, and significantly, positively related to changes in SE and QOL over a one-year period, across the entire Navy sample. Tests which assessed the differences in the magnitudes of the change (i.e., residualized gain) correlations indicated significantly stronger relationships between EX and DEP SE and/or QOL in individuals with a high school education than college graduates.

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92N22342*# ISSUE 13 PAGE 2233 CATEGORY 53 92/02/00 1 PAGES UNCLASSIFIED DOCUMENT

TITLE: Evaluating human performance modeling for system assessment: Promise and problems

AUTHORS: A/Patterson, Robert W.; B/Young, Michael J.

CORP: Aerospace Medical Research Labs., Wright-Patterson AFB, OH.

SAP: Avail: CASI HC A01/MF A04 In NASA. Johnson Space Center, 5th Annual Workshop on Space Operations Applications and Research (SOAR 1991), Volume 2 p 545 (SEE N92-22324 13-59)

CIO: United States--

MAJS: /*Command And Control/*Human Performance/*Mathematical Models/*Performance Prediction/*Psychomotor Performance

MINS: / Auditory Perception/ Cognition/ Control Simulation/ Flexibility/ Human Factors Engineering/ Prototypes/ Visual Perception

ABA: Author

ABSTRACT: The development and evaluation of computational human performance models is examined. An intention is to develop models which can be used to interact with system prototypes and simulations to perform system assessment. Currently LR is working on a set of models emulating cognitive, psychomotor, auditory, and visual activity for multiple operator positions of a command and control simulation system. These models, developed in conjunction with BBN Systems and Technologies, function within the simulation environment and allow for both unmanned system assessment and manned (human-in-loop) assessment of system interface and team interactions. These are relatively generic models with built-in flexibility which allows modification of some model parameters. These models have great potential for improving the efficiency and effectiveness of system design, test, and evaluation. However, the extent of the practical utility of these models is unclear. Initial verification efforts comparing model performance within the simulation to actual human operators on a similar, independent simulation have been performed and current efforts are directed at comparing human and model performance within the same simulation environment.

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91N30704 ISSUE 22 PAGE 3720 CATEGORY 54 ***RPT#***: CTN-91-60128 ***CNT#***: DCIEM-W7711-8-7042/01-SE 89/12/00 26 PAGES UNCLASSIFIED DOCUMENT DCAF C072010

TITLE: Evaluation of alternative methods for increasing tolerance to +Gz acceleration, phase 2
TLSP: Final Report

AUTHORS: A/Macdougall, J. D.

CORP: McMaster Univ., Hamilton (Ontario). ***CSS***: (Dept. of Physical Education and Dept. of Medicine.)

SAP: Avail: CASI HC A03

CIO: Canada--

MAJS: /*Acceleration Tolerance/*Blackout (Physiology)/*Blackout Prevention/* Blood Pressure/*Exercise Physiology/*Hemodynamic Responses/*High Gravity Environments/*Muscular Strength/*Physical Exercise

MINS: / Aerospace Medicine/ Aircraft Maneuvers/ Muscles/ Pilots (Personnel)/ Pressure Suits

ABA: Author (CISTI)

ABSTRACT: Unconsciousness can occur during exposure to sustained, headward radial acceleration (G) due to hypotension at head level; thus, methods of improving G tolerance of pilots of high performance aircraft are required. The aim of these experiments at 1 G was to determine an alternate protocol for forceful leg contractions that could assist the standard anti-G straining maneuver to increase blood pressure. Using an exercise of hip and knee extension in the sitting position, it was found that: (1) isometric, muscular contractions were more effective at increasing mean arterial blood pressure than concentric or eccentric contractions; (2) the relative intensity of the isometric contraction determined the magnitude of the blood pressure increase throughout a knee joint angle range of 75 to 105 deg; (3) simultaneous, double leg contractions produced greater blood pressure increases than alternating, single leg contractions; (4) a continuous 30 sec isometric contraction was superior to repeated 5 sec contractions followed by either 5 or 2 sec relaxation periods; and (5) the increase in blood pressure was independent of individual differences in absolute quadriceps muscle strength and/or muscle cross-sectional area, and was directly related to the relative intensity of contraction effort.

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91N30688# ISSUE 22 PAGE 3717 CATEGORY 52 91/02/19 1 PAGES UNCLASSIFIED DOCUMENT

TITLE: Predicting the effect of linear and angular impact acceleration on humans TLSP: Abstract Only

AUTHORS: A/Mazurin, Yu. V.; B/Stupakov, G. P.

CORP: Joint Publications Research Service, Arlington, VA.

SAP: Avail: CASI HC A01/MF A01 In its JPRS Report: Science and Technology. USSR: Life Sciences p 3 (SEE N91-30683 22-52)

CIO: USSR Transl. Into ENGLISH From Kosmicheskaya Biologiya I-- Aviakosmicheskaya Meditsina, Moscow (USSR), V. 23, No. 4, Jul.-Aug. 1989 P 79-83

MAJS: /*Aerospace Medicine/*Biodynamics/*Emergencies/*Flight Crews/*Hazards/* Human Body/*Impact Acceleration/*Injuries/*Man Machine Systems/* Physiological Responses/*Predictions/*Probability Theory

MINS: / Algorithms/ Data Processing/ Estimates/ Estimating/ Flexibility/ Flow Charts/ Mathematical Models/ Parameter Identification/ Safety/ Simulation

ABA: Author

ABSTRACT: Modern methods of optimizing man-machine system interactions require planning of the actions of the operator, not only under ordinary conditions of operation of an aircraft, but also under extreme conditions and emergency situations in which the operator may be exposed to high levels of linear and angular acceleration. Described here is a method for computer prediction of the probability of injury to individual subsystems of the body, as well as changes in activity, physiological responses, and subjective estimates of tolerance. The method is a combination of traditional methods of estimating the danger of injury in impact acceleration, and it is based on the determination of statistical relationships between biomechanical and other effects described in a mathematical model of the human body. A flow chart of the algorithm employed is presented. The method enables the expansion of the list of predicted effects and evaluation of the tolerance of complex actions. It decreases the demands for the degree of identification of parameters of the mathematical model and increases the flexibility of simulations, allowing modern methods to be used for the

accumulation and statistical processing of biomedical information and mathematical modeling to assure safety and continued efficiency of aircraft crews.

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91N26717# ISSUE 18 PAGE 3028 CATEGORY 52 ***RPT#***: AD-A234658 NHRC-90-43 90/11/30 22 PAGES UNCLASSIFIED DOCUMENT

TITLE: Smoking, exercise, and physical fitness ***TLSP***: Interim Report

AUTHORS: A/Conway, Terry L.; B/Cronan, Terry A.

CORP: Naval Health Research Center, San Diego, CA.

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Health/*Nicotine/*Physical Exercise/*Physical Fitness/*Respiratory Physiology

MINS: / Adipose Tissues/ Body Size (Biology)/ Muscular Strength/ Tobacco

ABA: DTIC

ABSTRACT: Research on smoking and physical activity provides strong evidence of smoking's negative impact and physical activity's positive impact on long-term health. However, evidence is lacking on the association between smoking and spontaneous exercise activity and the independent effects of these factors on physical fitness. These factors were studied in 3,045 Navy personnel. Smoking was clearly associated with lower exercise levels and lower physical endurance (cardiorespiratory and muscular) even after controlling for exercise. Smoking was not related to overall body strength (lean body mass) nor percent body fat after controlling for exercise. These findings suggests that both the direct and indirect links among smoking, exercise, and physical fitness should be explored in model's examining health.

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91N19695# ISSUE 11 PAGE 1762 CATEGORY 52 90/11/00 5 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT

TITLE: Weightlessness countermeasures and human physiology in space: A potential conflict

AUTHORS: A/Stegemann, Juergen P.

CORP: Deutsche Sporthochschule, Cologne (Germany). ***CSS***: (Inst. fuer Physiologie.)

SAP: Avail: CASI HC A01/MF A06; EPD, ESTEC, Noordwijk, Netherlands, HC 80 Dutch guilders In ESA, Fourth European Symposium on Life Sciences Research in Space p 631-635 (SEE N91-19572 11-51)

CIO: Germany--

MAJS: /*Countermeasures/*Education/*Long Duration Space Flight/*Physical Fitness /*Physiological Effects/*Training Devices/*Weightlessness

MINS: / Astronaut Performance/ Gravitational Effects/ Gravitational Physiology/ Muscular Strength/ Physical Exercise/ Psychological Factors

ABA: ESA

ABSTRACT: Experimental results revealed that the strength of partially athrophic muscles can be regained with relatively small effort. The designing of physical training for long term missions which does not disturb the well being of astronauts is discussed. Derived from some theoretical aspects, it is proposed to reduce their work capacity to 80 percent during about two thirds of the mission time, and then to train them up to their initial work capacity. This might overcome the psychological problems associated with extensive training time. Furthermore, food and oxygen are saved. A device which should allow astronauts to

combine scientific work with their fitness program is presented. Potential conflicts between health maintenance and research activities are outlined.

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91N19615# ISSUE 11 PAGE 1748 CATEGORY 52 90/11/00 2 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT

TITLE: Effects of training with reduced perfusion pressure on performance and muscle fiber characteristics

AUTHORS: A/Sundberg, Carl J.; B/Eiken, O.; C/Esbjoernsson, M.; D/Nygren, A.; E/Kaijser, L.
PAA: A/(Karolinska Inst., Stockholm (Sweden).); B/(Karolinska Inst., Stockholm (Sweden).); C/(Karolinska Hospital, Stockholm (Sweden).); D/(Karolinska Hospital, Stockholm, Sweden)

CORP: Karolinska Inst., Stockholm (Sweden). ***CSS***: (Dept. of Baromedicine.)

SAP: Avail: CASI HC A01/MF A06; EPD, ESTEC, Noordwijk, Netherlands, HC 80 Dutch guilders In ESA, Fourth European Symposium on Life Sciences Research in Space p 197-198 (SEE N91-19572 11-51)

CIO: Sweden--

MAJS: /*Durability/*Ischemia/*Microgravity/*Muscular Strength/*Physical Exercise

MINS: / Blood Flow/ Health/ Hypoxia/ Space Environment Simulation

ABA: ESA

ABSTRACT: Endurance training increases Performance Time (PT) during incremental exercise and may increase the Type 1 fiber percentage, capillary supply and oxidative enzyme content in skeletal muscle. Several factors alone or in combination may trigger these responses, e.g., hypoxia, ischemia, substrate deficiency or flux through aerobic metabolism. Leg exercise in microgravity is associated with reduced perfusion pressure, thus creating a relative ischemia compared to upright exercise at 1 G. The effects of training with reduced muscle perfusion (Ischemia) and training with non restricted muscle blood flow on endurance capacity and muscle fiber characteristics are compared.

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91N19587# ISSUE 11 PAGE 1744 CATEGORY 52 90/11/00 1 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT

TITLE: Oxygen uptake during concentric and eccentric resistive exercise using a new gravity-independent ergometer

AUTHORS: A/Berg, Hans E.; B/Tesch, Per A.

CORP: Karolinska Inst., Stockholm (Sweden). ***CSS***: (Environmental Physiology Lab.)

SAP: Avail: CASI HC A01/MF A06; EPD, ESTEC, Noordwijk, Netherlands, HC 80 Dutch guilders In ESA, Fourth European Symposium on Life Sciences Research in Space p 77 (SEE N91-19572 11-51)

CIO: Sweden--

MAJS: /*Ergometers/*Microgravity/*Muscular Strength/*Oxygen Consumption/* Physical Exercise

MINS: / Gravitational Effects/ Musculoskeletal System/ Training Devices

ABA: ESA

ABSTRACT: An ergometer for strength training of postural muscle groups in microgravity was evaluated. The gravity independent non electrical device examined is designed for heavy resistive exercise of the lower limbs. Oxygen uptake ranged 1.1 to 2.1 l/minutes during

exercise, while forces exerted ranged 1365 to 1600 Newtons. Oxygen cost and muscular loading were of the same magnitude as previously reported for heavy resistance exercise using conventional exercise equipment. It is concluded that concentric eccentric heavy resistance training using large postural muscle groups can be performed at a low oxygen cost using the gravity independent ergonometer examined.

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91N12189# ISSUE 3 PAGE 394 CATEGORY 52 ***RPT#***: AD-A224642 AFIT/CI/CIA-90-063 90/00/00 105 PAGES UNCLASSIFIED DOCUMENT

TITLE: A normative data study of isometric neck strength in healthy, adult males, ages 18-35 ***TLSP***: M.S. Thesis

AUTHORS: A/Keller, Julie Riedel

CORP: Kentucky Univ., Lexington, KY.

SAP: Avail: CASI HC A06/MF A02

CIO: United States Sponsored By Afit, Wright-Patterson Afb, Oh--

MAJS: /*Anthropometry/*Flexibility/*Males/*Muscular Strength/*Neck (Anatomy)/* Spine

MINS: / Bending/ Flexing/ Loads (Forces)/ Predictions

ABA: DTIC

ABSTRACT: Isometric neck muscle contraction forces generated during attempted neck flexion, extension, and side bending by sixty subjects were measured using a load cell in order to establish normal ranges for cervical muscle strength. Contraction forces during three trials were collected and measured using ASYST 2.01. Time averaged forces and instantaneous peak forces generated were compared and no significant differences were evident. Measured mean extension forces (236 N) exceeded mean flexion forces (202 N) and mean side bending forces (155 N). Anthropometric measurements correlated poorly with measured cervical forces and are not recommended as cervical strength predictors. Correlations between dominant grip strength and neck strength were sought but no relationship was apparent. Force variability between trials was evaluated with analysis of variance testing, with significance set at p is less than 0.05. Increased forces were generated by successive contractions. Comparisons between right and left lateral neck strength indicated no statistically significant functional asymmetry between the two sides. Six subjects (10 percent) were randomly selected to return for repeat testing to evaluate test-retest reliability using paired t-tests, and no consistent differences between tests were evident.

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91N10587*# ISSUE 1 PAGE 101 CATEGORY 52 89/10/00 7 PAGES UNCLASSIFIED DOCUMENT

TITLE: Cardiovascular group

AUTHORS: A/Blomqvist, Gunnar

CORP: Texas Univ. Health Science Center, Dallas, TX. ***CSS***: (Div. of Cardiology.)

SAP: Avail: CASI HC A02/MF A02 In NASA, Johnson Space Center, Workshop on Exercise Prescription for Long-Duration Space Flight p 117-123 (SEE N91-10574 01-52)

CIO: United States--

MAJS: /*Adaptation/*Blood Volume/*Cardiovascular System/*Exercise Physiology/* Gas Analysis/*Muscles/*Muscular Tonus/*Physical Exercise/*Physiology/* Space Flight Stress/*Workloads (Psychophysiology)

MINS: / Health/ Hypotension/ Maintenance/ Organs/ Oxygen/ Preserving/ Treadmills / Ventilation

ABA: Author

ABSTRACT: As a starting point, the group defined a primary goal of maintaining in flight a level of systemic oxygen transport capacity comparable to each individual's preflight upright baseline. The goal of maintaining capacity at preflight levels would seem to be a reasonable objective for several different reasons, including the maintenance of good health in general and the preservation of sufficient cardiovascular reserve capacity to meet operational demands. It is also important not to introduce confounding variables in whatever other physiological studies are being performed. A change in the level of fitness is likely to be a significant confounding variable in the study of many organ systems. The principal component of the in-flight cardiovascular exercise program should be large-muscle activity such as treadmill exercise. It is desirable that at least one session per week be monitored to assure maintenance of proper functional levels and to provide guidance for any adjustments of the exercise prescription. Appropriate measurements include evaluation of the heart-rate/workload or the heart-rate/oxygen-uptake relationship. Respiratory gas analysis is helpful by providing better opportunities to document relative workload levels from analysis of the interrelationships among VO2, VCO2, and ventilation. The committee felt that there is no clear evidence that any particular in-flight exercise regimen is protective against orthostatic hypotension during the early readaptation phase. Some group members suggested that maintenance of the lower body muscle mass and muscle tone may be helpful. There is also evidence that late in-flight interventions to reexpand blood volume to preflight levels are helpful in preventing or minimizing postflight orthostatic hypotension.

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91N10578*# ISSUE 1 PAGE 99 CATEGORY 52 89/10/00 8 PAGES UNCLASSIFIED DOCUMENT

TITLE: Work, exercise, and space flight. 1: Operations, environment, and effects of spaceflight

AUTHORS: A/Thornton, William

CORP: National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

SAP: Avail: CASI HC A02/MF A02 In its Workshop on Exercise Prescription for Long-Duration Space Flight p 23-30 (SEE N91-10574 01-52)

CIO: United States--

MAJS: /*Adaptation/*Astronauts/*Countermeasures/*Environment Effects/*Health/* Physical Exercise/*Space Flight Stress/*Weightlessness

MINS: / Cardiovascular System/ Education/ Human Body/ Life Sciences/ Musculoskeletal System/ Neuromuscular Transmission/ Populations/ Respiratory System

ABA: Author

ABSTRACT: The selection, training, and operations of space flight impose significant physical demands which seem to be adequately met by the existing physical training facilities and informal individual exercise programs. The professional astronaut population has, by selection, better than average health and physical capacity. The essentials of life on earth are adequately met by the spacecraft. However, as the human body adapts to weightlessness, it is compromised for the usual life on earth, but readaptation is rapid. Long term flight without countermeasures will produce major changes in the cardiovascular, respiratory, musculoskeletal and neuromuscular systems. There is strong theoretical and

experimental evidence from 1-g studies and limited in-flight evidence to believe that exercise is a key counter-measure to many of these adaptations.

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90N27264# ISSUE 21 PAGE 3037 CATEGORY 54 ***RPT#***: AD-A222046 AFIT/CI/CIA-90-020 90/05/00 139 PAGES UNCLASSIFIED DOCUMENT

TITLE: The relationship of isometric grip strength, optimal dynamometer settings, and certain anthropometric factors ***TLSP***: M.S. Thesis

AUTHORS: A/Reith, Michael Scot

CORP: Virginia Commonwealth Univ., Richmond, VA. ***CSS***: (Dept. of Occupational Therapy.)

SAP: Avail: CASI HC A07/MF A02

CIO: United States Sponsored By Afit, Wright-Patterson Afb, Oh--

MAJS: /*Anthropometry/*Dynamometers/*Handles/*Manual Control/*Muscular Strength /*Physical Fitness

MINS: / Hand (Anatomy)/ Optimization/ Position (Location)/ Regression Analysis/ Size (Dimensions)

ABA: DTIC

ABSTRACT: A study was conducted to determine: (1) the relationships between isometric grip strength and eight anthropometric dimensions of the upper extremity, (2) the relationship between isometric grip strength and handle position of the Jamar dynamometer, and (3) a means of predicting optimal positioning of the Jamar dynamometer handle. Measurements were taken from 30 females between the ages of 21 and 25. Data were analyzed by means of the Pearson product-moment correlation, ANOVA and multiple ANOVA, predictive discrimination, and multiple regression. Significant correlations (p less than .05) existed between all dimensions of the hand and grip strength in all handle positions except the smallest, ranging from .36 to .61. Analysis of variance demonstrated significant differences between strength at the different handle positions. The results support the use of position two or three of the Jamar dynamometer handle for testing of maximum grip strength. Specific adjustment of the dynamometer handle seems unnecessary, but if desired it should be based upon hand length or length of the long digit. No anthropometric dimension appears to be strong enough to predict grip strength.

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90N26453*# ISSUE 20 PAGE 2891 CATEGORY 51 90/02/00 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: Effects of microgravity on rat muscle

AUTHORS: A/Riley, D. A.

CORP: Medical Coll. of Wisconsin, Milwaukee, WI. ***CSS***: (Dept. of Anatomy and Cellular Biology.)

SAP: Avail: CASI HC A01/MF A04 In NASA, Ames Research Center, The US Experiments Flown on the Soviet Biosatellite Cosmos 1887 p 45-49 (SEE N90-26452 20-51)

CIO: United States--

MAJS: /*Gravitational Effects/*Long Duration Space Flight/*Microgravity/*Muscles /*Muscular Function/*Physical Exercise/*Rats/*Workloads (Psychophysiology)

MINS: / Adaptation/ Biochemistry/ Cosmos Satellites/ Deterioration/ Health/ Heart/ Heterogeneity

ABA: Author

ABSTRACT: It is well known that humans exposed to long term spaceflight experience undesirable progressive muscle weakness and increased fatigability. This problem has prompted the implementation of inflight exercise programs because most investigators believe that the major cause of diminished muscle performance is a combination of disuse and decreased workload. Inflight exercise has improved muscle health, but deficits have persisted, indicating that either the regimens utilized were suboptimal or there existed additional debilitating factors which were not remedied by exercise. Clarification of this question requires an improved understanding of the cellular and molecular basis of spaceflight-induced muscle deterioration. To this end, multiple investigations have been performed on the muscles from rats orbited 5 to 22 days in Cosmos biosatellites and Spacelab-3 (2,4,5,8,10 to 14,16,18,19,21 to 23,25,27,28). The eight Cosmos 1887 investigations examined the structural and biochemical changes in skeletal and cardiac muscles of rats exposed to microgravity for 12.5 days and returned to terrestrial gravity 2.3 days before tissues were collected. Even though interpretation of these results was complicated by the combination of inflight and postflight induced alterations, the consensus is that there is marked heterogeneity in both degree and type of responses from the whole muscle level down to the molecular level. Collectively, the muscle investigations of Cosmos 1887 clearly illustrate the wide diversity of muscle tissue responses to spaceflight. Judging from the summary report of this mission, heterogeneity of responses is not unique to muscle tissue. Elucidating the mechanism underlying this heterogeneity holds the key to explaining adaptation of the organism to prolonged spaceflight.

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90N20629# ISSUE 13 PAGE 1852 CATEGORY 52 ***RPT#***: AD-A217969 USARIEM-T7-90 ***CNT#***: DA PROJ. 3E1-162787-A-879 89/11/00 72 PAGES UNCLASSIFIED DOCUMENT

TITLE: Hydration effects on human physiology and exercise-heat performance

AUTHORS: A/Sawka, Michael N.; B/Young, Andrew J.; C/Latzka, William A.; D/Neufer, P. Darrell; E/Pandolf, Kent B.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA.

SAP: Avail: CASI HC A04/MF A01

CIO: United States--

MAJS: /*Dehydration/*Evaporation Rate/*Hemodynamic Responses/*Human Performance /*Perspiration/*Physical Exercise/*Thermoregulation

MINS: / Anaerobes/ Biodegradation/ Blood Volume/ Fatigue Life/ Heart/ Metabolism / Muscular Strength/ Polysaccharides/ Stress (Physiology)/ Thermal Environments

ABA: DTIC

ABSTRACT: During exercise in the heat, sweat output often exceeds water intake resulting in hypohydration, which defined as body fluid deficit. This fluid deficit is comprised of water loss from both the intracellular and extracellular fluid compartments. There is no evidence that hypohydration can benefit exercise performance; in addition, man cannot adapt to chronic dehydration. Exercise tasks that primarily require aerobic metabolism and that are prolonged will more likely be adversely influenced by hypohydration than exercise tasks that require anaerobic metabolism as well as muscular strength and power. Likewise, the warmer the environmental temperature, the greater the potential for hypohydration to cause decrements in all types of exercise performance. Hypohydration causes a greater heat storage and reduces endurance as well as maximal effort exercise performance in

comparison to euhydration levels. The greater heat storage is mediated by a decreased sweating rate (evaporative heat loss) as well as by a decreased cutaneous blood flow (dry heat loss). These response decrements were attributed to both a plasma hyperosmolality and a reduced blood volume. The reduced blood volume also makes it difficult to maintain an adequate cardiac output during exercise-heat stress. Finally, preliminary data indicate that hypohydration does not alter muscle glycogen utilization during exercise or the glycogen resynthesis during recovery from exercise.

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90N20619# ISSUE 13 PAGE 1850 CATEGORY 52 ***RPT#***: AD-A217204 DCIEM-89-RR-48 89/12/00 45 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical performance and carbohydrate consumption in CF commandos during a 5-day field trial

AUTHORS: A/Jacobs, I.; B/Vanloon, D.; C/Pasut, L.; D/Pope, J.; E/Bell, D.

CORP: Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario).

SAP: Avail: CASI HC A03/MF A01

CIO: Canada--

MAJS: /*Armed Forces (Foreign)/*Armed Forces (United States)/*Carbohydrates/* Consumption/*Energy Storage/*Human Performance/*Metabolism/*Military Operations/*Muscular Strength/*Nutrition/*Personnel/*Rations

MINS: / Anaerobes/ Biodegradation/ Blood/ Heat Measurement/ Mission Planning/ Reaction Time/ Tissues (Biology)

ABA: DTIC

ABSTRACT: This study evaluated the capacity of military personnel to perform maximal exercise before and after 5 days of sustained physical activity. An additional goal was to evaluate whether a carbohydrate supplement to the regular field rations would reduce the extent of any performance impairments. Subjects (Ss) were 29 male volunteers from the Canadian Forces Airborne Regiment. They were allowed 4 to 5 h sleep each 24h and 45 min per meal, but were otherwise continuously occupied with physically demanding missions in a field environment. Performance tests administered 2 days before and at the end of a the 5-day field trial included evaluations of maximal** aerobic** power during cycle exercise, anaerobic power, muscular strength and endurance, rate of maximal force development and reaction time. Muscle and blood tissue samples were obtained before and after the trial to clarify the relative contribution of fat and carbohydrate energy stores to meeting the metabolic cost of the field trial. The results demonstrated that the Ss were in a marked negative caloric balance by the end of the field trial. Skeletal muscle glycogen stores were markedly depleted. There were impairments maximal aerobic power, maximal dynamic strength, and anaerobic power of large muscle groups. These observations have direct implications for mission planning and physical performance expectations of military units involved in sustained operation

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90N17267# ISSUE 9 PAGE 1252 CATEGORY 52 ***RPT#***: AD-A215286 89/10/27 27 PAGES UNCLASSIFIED DOCUMENT

TITLE: Effectiveness of progressive resistance training for increasing maximal repetitive lifting capacity

AUTHORS: A/Sharp, Marilyn A.; B/Harman, Everett A.; C/Boutilier, Brian E.; D/Bovee, Matthew W.; E/Kraemer, William J.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. ***CSS***: (Exercise Physiology Div.)
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Habits/*Human Performance/*Materials Handling/*Physical Exercise/* Physical Fitness/*Repetition/*Tasks
MINS: / Boxes (Containers)/ Education/ Thorax
ABA: DTIC
ABSTRACT: The purpose was to investigate the effects of 12 weeks of progressive resistance training on the performance of a high intensity repetitive lifting task. The repetitive lifting task consisted of lifting a 41 kg box to a chest high shelf as many times as possible in 10 min. Subjects were randomly assigned to a training (TR) or a control group (CT). The TR group (n=18) participated in progressive resistance training 3 times each week for 12 weeks. The CT group (n=7) was asked to maintain their current exercise habits which did not include progressive resistance training. Repetitive lifting task performance and one repetition maximum strength for box lift, bench press, deadlift and squat were recorded before and after progressive resistance training. Improvement in the strength of the training group was significantly greater (p less than .05) than that of the CT group. The increase in strength was accompanied by greater change (p less than .05) in repetitive lifting task performance for the training group (pre-test = 79.1 lifts, post-test = 92.4 lifts) than the CT group (pre-test = 84.9 lifts, post-test = 82.0 lifts). It is concluded that traditional progressive resistance training exercises are effective in improving performance of an occupational lifting task. Regular progressive resistance training can be particularly important in maintaining the effectiveness of manual workers in jobs that require high intensity lifting on an infrequent basis.

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90N12179# ISSUE 3 PAGE 383 CATEGORY 54 ***RPT#***: PB89-200935 ***CNT#***: PHS-OH-02178 88/11/28 25 PAGES UNCLASSIFIED DOCUMENT
TITLE: Wrist orientation effect on grip strength and endurance ***TLSP***: Final Report
AUTHORS: A/Pytel, Jean Landa; B/Mackin, Thomas J.
CORP: Pennsylvania State Univ., University Park, PA. ***CSS***: (Dept. of Engineering Science and Mechanics.)
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Human Factors Engineering/*Muscular Strength/*Physiological Factors/* Physiological Tests/*Wrist
MINS: / Anatomy/ Arm (Anatomy)/ Hand (Anatomy)
ABA: NTIS
ABSTRACT: The study provides basic data about some factors that may affect the ability of an individual to apply a gripping force. The study determines the effect of wrist orientation on grip strength and grip endurance. Twenty men and 20 women were used as subjects. They were asked to apply a maximum static force to a grip dynamometer and maintain a maximum contraction until their gripping force falls to 70 percent of the peak. The duration of the grip force application was used as a measure of fatigue time or endurance. Peak

forces and linear impulses (to determine how the gripping force changed) of the gripping forces at various wrist orientations were measured and related to the maximum values generated by each subject. Wrist orientations varied by 15-degree increments in wrist angle in four directions: plantar flexion, dorsiflexion, ulnar deviation and radial deviation. Relative changes in peak force, fatigue time and linear impulse were evaluated for all the subjects at all wrist positions and also compared between sex groups. This type of basic data is of use to those people who are concerned with musculoskeletal disorders. They will be able to suggest changes in the manner in which a tool is held in order to decrease the susceptibility of an individual to musculoskeletal disorders.

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89N19798# ISSUE 12 PAGE 1712 CATEGORY 52 ***RPT#***: AD-A201518 AFIT/GSM/LS/88S-12 88/09/00 131 PAGES UNCLASSIFIED DOCUMENT

TITLE: A study to analyze the degree of the relationship between health practices and fatigue ***TLSP***: M.S. Thesis

AUTHORS: A/Kennedy, Sherry L.

CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH.

SAP: Avail: CASI HC A07/MF A02

CIO: United States--

MAJS: /*Fatigue (Biology)/*Habits/*Health/*Stress (Physiology)/*Stress (Psychology)

MINS: / Alcohols/ Caffeine/ Eating/ Nicotine/ Physical Exercise/ Sleep

ABA: DTIC

ABSTRACT: The intention of this research was to examine the health practices of higher ranked individuals, both military and civilian, at Aeronautical Systems Division to determine if a relationship exists between the health practices they are following and the amount of fatigue they are experiencing. The health practices studied were: alcohol consumption, caffeine consumption, amount of exercise, eating habits, sleeping habits, smoking habits, and psychological stress management. These seven health practices were analyzed and compared to the amount of fatigue being experienced for both psychological and physiological fatigue. The level of fatigue was determined by individual responses to subjective self-analysis questions. Comparisons were also made between military and civilian personnel to determine if significant differences existed in health practices or in levels of fatigue.

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89N18005# ISSUE 10 PAGE 1392 CATEGORY 52 ***RPT#***: AD-A201062 88/10/13 28 PAGES UNCLASSIFIED DOCUMENT

TITLE: Factors in maximal power production and in exercise endurance relative to maximal power ***TLSP***: Report, for Aug. 1986 - Oct. 1988

AUTHORS: A/Patton, John F.; B/Kraemer, W. J.; C/Knuttgen, H. G.; D/Harman, E. A.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. ***CSS***: (Exercise Physiology Div.)

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Ergometers/*Fatigue (Biology)/*Muscles/*Muscular Fatigue/*Muscular Strength/*Physical Exercise

MINS: / Anaerobes/ Biodegradation/ Cycles/ Displacement/ Fats/ Fibers/ Leg (Anatomy)/ Morphology/ Physical Fitness/ Rates (Per Time)
ABA: DTIC
ABSTRACT: The relationship of muscle fiber type and mass to maximal power production and the maintenance of power (endurance time to exhaustion) at 36, 55, and 73 percent of maximal power was investigated in 18 untrained but physically active male subjects. Power output was determined at constant velocity (60 RPM) on a high intensity cycle ergometer instrumented with force transducers and interfaced with a computer. Fat free mass was determined by hydro-static weighing, fat free thigh volume by water displacement and skinfold measurement, and percentage and area of type 2 fibers from biopsies of the vastus lateralis. Maximal power averaged 771 + or - 149 W with a range of 527 to 1125 W. No significant correlations were found among percentage of type 2 fibers, relative area of type 2 fibers, or fat free thigh volume and maximal power or endurance times to exhaustion at any percentage of maximal power. Weak but significant relationships were found for fat free mass with both maximal power (r=0.57) and endurance time at 73 percent of maximal power (r=0.47). These results show maximal power to be more dependent on factors related to body size than muscle fibers characteristics.

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88N28615# ISSUE 22 PAGE 3131 CATEGORY 52 ***RPT#***: AD-A192657 88/02/05 27 PAGES UNCLASSIFIED DOCUMENT
TITLE: The impact of hyperthermia and hypohydration on circulation, strength, endurance and health
AUTHORS: A/Armstrong, Lawrence E.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA.
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Blood Circulation/*Fatigue (Biology)/*Health/*Human Performance/* Hydration/*Hyperthermia/*Stress (Physiology)
MINS: / Athletes/ Cardiovascular System/ Cramps/ Electrolytes/ Heart Rate/ Heat Stroke/ High Temperature Environments/ Physical Fitness/ Rest/ Syncope/ Water
ABA: DTIC
ABSTRACT: This article reviews the effects of hot environments--and thus hyperthermia and hypohydration--on circulation, strength, endurance, and health in athletes. The cardiovascular responses to heat exposure at rest, and during exercise, are reviewed. Performance is reviewed by examining strength, power and endurance; the impact of hyperthermia, hypohydration and diuretic use on performance are discussed. The physiological needs for water, salt and carbohydrates have been examined. The four major heat illnesses (i.e., heat cramps, heat syncope, heat exhaustion, heatstroke) are described, as well as preventive measures to counteract hyperthermia and hypohydration.

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88N28610# ISSUE 22 PAGE 3130 CATEGORY 52 ***RPT#***: AD-A192650 88/02/00 31 PAGES UNCLASSIFIED DOCUMENT
TITLE: The effects of acute cold exposure on exercise performance
AUTHORS: A/Patton, John F., Iii
CORP: Army Research Inst. of Environmental Medicine, Natick, MA.

SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Cold Tolerance/*Human Performance/*Muscular Strength/*Peripheral Circulation/*Physical Exercise/*Vasoconstriction
MINS: / Clothing/ Fatigue Life/ Frostbite/ Hypothermia/ Injuries/ Insulation/ Low Temperature Environments/ Physiological Effects/ Prevention
ABA: DTIC
ABSTRACT: The physiological effects of a cold environment include peripheral vasoconstriction, shivering thermogenesis, and muscle tension development alterations. Performance in endurance events and performance in strength events have been discussed. Potential sites of cold injury have been reviewed, and the major forms of cold injury (including frostnip, hypothermia, frostbite) have been outlined. Both activity levels and clothing insulation are important to individuals who exercise in cold environments, as preventive measures.

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88N20808# ISSUE 13 PAGE 1809 CATEGORY 52 ***RPT#***: AD-A189305 NHRC-87-26 87/10/21 49 PAGES UNCLASSIFIED DOCUMENT
TITLE: Lifting and carrying capacities relative to physical fitness measures TLSP: Final Report
AUTHORS: A/Beckett, Marcie B.; B/Hodgdon, James A.
CORP: Naval Health Research Center, San Diego, CA.
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Human Body/*Human Performance/*Physical Fitness/*Physical Work/*Tasks
MINS: / Females/ Maintainability/ Males/ Mass/ Military Operations/ Navy/ Ships/ Simulation/ Substitutes/ Tools
ABA: DTIC
ABSTRACT: Through the Physical Readiness Test (PRT), the Navy assesses the physical fitness and body composition of its members. Those fitness attributes which contribute to optimal Navy job performance have not yet been fully identified. The purpose of this study was to determine the extent to which performance of simulated general shipboard work can be predicted by measures of physical capacity. Three tasks representative of general shipboard work were developed - a long duration carry and two maximal box lifting tests. These tasks, as well as, PRT items (including lean body mass LBM from body circumference and weight), other field fitness measures, and Incremental Lift Machine (ILM) tests were performed by 102 Navy men and women. Substitution of broad jump score for LBM offers a small improvement in task prediction. ILM scores offer lift capacity prediction comparable to that obtained from PRT and broad jump scores. LBM, broad jump and ILM scores are all strong indicators of overall body strength. If these prediction methods are to be implemented as screening or selection tools, critical lifting and carrying task parameters for Navy jobs must be defined. In addition, further research is needed to cross-validate results obtained in this study and to expand prediction application.

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87N14836# ISSUE 6 PAGE 801 CATEGORY 52 ***RPT#***: AD-A169597 86/00/00 30 PAGES UNCLASSIFIED DOCUMENT

TITLE: Influence of a 3.5 day fast on physical performance running heading: Fasting and performance
AUTHORS: A/Knapik, J.; B/Jones, B.; C/Meredith, C.; D/Evans, W. J.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA.
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Fasting/*Human Performance/*Kinetics/*Muscular Strength/*Oxygen Consumption/*Physical Fitness
MINS: / Daytime/ Food Intake/ Heart Rate/ Physical Exercise/ Ventilation
ABA: DTIC
ABSTRACT: The influence of a 14 h fast or a 3.5 day fast on physical performance was investigated in 8 young men. In both conditions they were tested for isometric strength, isokinetic strength (elbow flexors, 30 degs/sec and 180 degs/sec), anaerobic capacity and aerobic endurance. Anaerobic capacity was evaluated by having subjects perform 50 rapidly repeated isokinetic contractions of the elbow flexors at 180 degs/sec. Aerobic endurance was measured as time to volitional fatigue during a cycle ergometer exercise at 45% VO2 max. Measures of VO2, V sub E, heart rate, and ratings of perceived exertion were obtained prior to and during the cycle exercise. The 3.5 day fast did not influence isometric strength, anaerobic capacity or aerobic endurance, but isokinetic strength was significantly reduced (approx. 10%) at both velocities. VO2, V sub E and perceived exertion were not affected by fasting. Fasting significantly increased heart rate during exercise but not at rest. It was concluded that there are minimal impairments in physical performance as a result of a 3.5 day fast provided there is little physical activity during the fasting period.

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87N12150# ISSUE 3 PAGE 375 CATEGORY 52 ***RPT#***: AD-A168260 DCIEM-86-R-22 86/04/00 22 PAGES UNCLASSIFIED DOCUMENT
TITLE: Relationship of field tests to laboratory tests of muscular strength and endurance, and maximal aerobic power
AUTHORS: A/Bell, D. G.; B/Jacobs, I.
CORP: Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario).
SAP: Avail: CASI HC A03/MF A01
CIO: Canada--
MAJS: /*Canada/*Computer Techniques/*Fatigue (Biology)/*Heart Rate/*Muscular Strength/*Physical Fitness/*Physiological Responses
MINS: / Armed Forces (Foreign)/ Correlation/ Exercise Physiology/ Hydraulic Equipment/ Training Evaluation
ABA: DTIC
ABSTRACT: This study evaluates the relationship between established laboratory tests of selected physical fitness components and a field tests battery (EXPRES) presently used annually to evaluate the physical fitness of Canadian Force personnel. Muscular strength, muscular endurance and maximal aerobic power were evaluated in 33 male personnel. The EXPRES test battery included isometric handgrip dynamometry as an indicator of strength, pushups and situps as indicators of muscular endurance, and maximal aerobic power was predicted from the heart rate response to a submaximal step-test. The laboratory measures of strength consisted of maximal isokinetic and isometric contractions of the body's large

muscle groups performed on a computerized strength evaluation system. Maximal power generated during a 30 s cycle ergometer sprint (Wingate Test) was used as the laboratory measure of muscular endurance. Maximal aerobic power was measured directly during exhaustive cycle exercise. When correlation coefficients were calculated for the various field and laboratory tests, the values range from 0.46 - 0.67 for muscular strength, 0.49 - o.58 for endurance, and 0.65 for maximal aerobic power. All correlation coefficients were statistically significant (pless than 0.01), but the standard errors about the regression lines were quite large.

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86N25980# ISSUE 16 PAGE 2630 CATEGORY 52 ***RPT#***: AD-A164060 USARIEM-M-11/86 86/01/00 66 PAGES UNCLASSIFIED DOCUMENT

TITLE: Fitness and activity assessments among US Army populations: Implications for NCHS general population surveys

AUTHORS: A/Vogel, J. A.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: United States--

MAJS: /*Body Weight/*Exercise Physiology/*Muscular Strength/*Physical Fitness

MINS: / Armed Forces (United States)/ Fatigue (Biology)/ Personnel

ABA: DTIC

ABSTRACT: The military forces of this country represent the largest population for which physical fitness is routinely assessed. Field measures of aerobic power, muscle strength and muscular endurance, along with body weight, are measured twice yearly in the U.S. Army through age 60. Field measures are defined as those conducted by army units without the aid of equipment or indoor facilities. The purpose of these periodic fitness evaluations is both as an indicator of the adequacy of training to meet performance goals as well as a motivator to the individual to train and improve their fitness level. In addition to these periodic field measures, extensive population surveys of laboratory-measured fitness and activity assessment have been made in a wide variety of Army units over the past ten years by the Exercise Physiology Division, US Army Research Institute of Environmental Medicine. These assessments have been part of an ongoing research program to study factors influencing fitness in the Army. This chapter presents a description of the survey methods and sample data from both approaches.

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86N25122*# ISSUE 15 PAGE 2484 CATEGORY 54 ***RPT#***: NASA-TM-83102 NAS 1.15:83102 ***CNT#***: NAS10-10285 85/09/00 55 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical, anthropometrical, and body composition characteristics of workers at Kennedy Space Center

AUTHORS: A/Lasley, M. L.

CORP: National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL. AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: United States--

MAJS: /*Anthropometry/*Body Composition (Biology)/*Human Factors Engineering/* Physical Exercise/*Physical Fitness/*Physiological Responses

MINS: / Flexibility/ Males/ Protective Clothing/ Work Capacity
ABA: Author
ABSTRACT: At the Kennedy Space Center, workers are often exposed to cardiovascular and muscular stress in job-related activities which may require a high level of physical fitness in order to safely complete the work task. Similar tasks will be performed at other launch and landing facilities and in space for the Space Station. One such category includes workers who handle toxic propellants and must wear Self-Contained Atmospheric Protective Ensembles (SCAPE) that can weigh 56 lbs. with the air pack. These suits provide a significant physical challenge to many of the workers in terms of carrying this load while moving about and performing work. Furthermore, under some conditions, there is a significant thermal stress. The physical characteristics of these workers are, therefore, of consequence. The purpose of this study was to analyze the anthropometry, body composition, strength, power, endurance, flexibility, aerobic fitness, and blood variables of a representative sample of male KSC SCAPE workers and to compare them with characteristics of other male workers at KSC (total population N=110). Three separate comparisons were made.

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86N24198# ISSUE 14 PAGE 2334 CATEGORY 52 ***RPT#***: AD-A162003 USARIEM-M-2/86 85/07/15 33 PAGES UNCLASSIFIED DOCUMENT
TITLE: Respiratory response and muscle function during isometric handgrip exercise at high altitude
AUTHORS: A/Burse, R. L.; B/Cymerman, A.; C/Young, A. J.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Altitude Sickness/*Body Weight/*Circulation/*Descent/*Fatigue (Biology) /*Hand (Anatomy)/*High Altitude/*Hyperventilation/*Hypoxia/*Muscular Fatigue/*Muscular Function/*Muscular Strength/*Physical Exercise/* Physiological Effects/*Respiratory Diseases/*Sea Level/*Ventilation
MINS: / Exercise Physiology/ Exposure/ Physical Exercise/ Responses/ Time
ABA: DTIC
ABSTRACT: The purpose of this investigation was to determine if the hyperventilatory response to fatiguing isometric exercise at sea level could predict resting ventiliation and acute mountain sickness (AMS) at 4300 m altitude. Exercise consisted of four successive endurance handgrips held to complete fatigue at 40% of maximum isometric handgrip strength (MHS). There was no relationship between the magnitude or pattern of exercise-induced hyperventiliation at sea level and the severity of AMS later at altitude. Sea level hyperventilatory response was not predictive of resting ventilation at altitude. Altitude exposure progressively increased both the incidence and magnitude of the hyperventilatory response to exercise and prolonged it for 60 to 90 s into the recovery period, providing support for the central command theory of ventilatory control during isometric exercise. MHS was significantly increased at altitude, by 11% on day 2 and 16% on day 6. Endurance times to fatigue were reduced, but not always significantly so.

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86N21111# ISSUE 11 PAGE 1833 CATEGORY 52 ***RPT#***: AD-A160687 USARIEM-M40/85 85/09/00 15 PAGES UNCLASSIFIED DOCUMENT

TITLE: Comparison of male and female maximum lifting capacity

AUTHORS: A/Teves, M. A.; B/Vogel, J. A.; C/Wright, J. E.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Females/*Lift/*Males/*Muscular Strength/*Work Capacity

MINS: / Body Weight/ Comparison/ Employment/ Human Body/ Mass Ratios/ Physical Fitness/ Training Evaluation

ABA: DTIC

ABSTRACT: A large influx of women into traditionally male fields of employment has drawn much attention to the strength differences between men and women. Two tests of isometric strength (handgrip and upright pull) and two tests of maximum lift capacity (a weight lift machine-IDL 152 and a weighted box lift MLC 132) were administered to 90 male and 107 female soldiers at the end of their Basic Training in order to examine differences in female/male (F/M) strength ratio. Skinfold measurements were made to obtain an estimate of lean body mass (LBM). Females exhibited 63% of the isometric strength and 55-59% of the lifting capacity of males. When the scores were normalized for body weight (BW) females were 75% as strong as males on isometric measures, and were able to lift 66% as much on IDL 152 and 72% as much on MLC 132. Comparison of the two lifting tasks revealed that on the average, males were able to lift 18% more weight and 24% more weight on the free lift than on the machine lift. This would suggest that if a machine lift is used for pre-employment screening purposes, the absolute weight an applicant is required to lift on the machine need not equal the maximum weight to be lifted on the job. As the difference between a machine lift and a free lift task was greater in females, a machine lift test may pose a greater disadvantage to female candidates than would isometric or free weight lift testing.

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86N15910# ISSUE 6 PAGE 995 CATEGORY 52 ***RPT#***: AD-A159419 NAVHLTHRSCHC-85-13 ***CNT#***: M00-96-PN 85/06/00 17 PAGES UNCLASSIFIED DOCUMENT

TITLE: A comparison of the effects of circuit weight training on men and women TLSP: Interim Report

AUTHORS: A/Marcinik, E. J.; B/Hodgdon, J. A.; C/Obrien, J. J.; D/Mittleman, K.

CORP: Naval Health Research Center, San Diego, CA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Education/*Females/*Human Beings/*Human Performance/*Muscular Strength/* Ships/*Weight (Mass)

MINS: / Circuits/ Comparison/ Dynamic Characteristics/ Education/ Format/ Maintainability/ Physical Fitness/ Tasks/ Work

ABA: DTIC

ABSTRACT: Prior to training, women exhibited 52.6% of male upper torso dynamic strength and 56.5% of male lower torso dynamic strength. Both sexes responded in a similar manner to the circuit weight training format. Dynamic muscular strength gains were 13.7% for men and 15.7% women. Stamina and all indices of relative body composition were unaffected

by training. It can be concluded that circuit weight training demonstrates a potential for shipboard application. It results in the muscular strength gains shown to be necessary for shipboard work performance. It also helps to maintain aerobic fitness in a limited space environment.

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85N35621# ISSUE 24 PAGE 4133 CATEGORY 53 ***RPT#***: AD-A156248 ACSC-85-1725 85/04/00 43 PAGES UNCLASSIFIED DOCUMENT

TITLE: Relaxation techniques

AUTHORS: A/Marconi-Dooley, R.

CORP: Air Command and Staff Coll., Maxwell AFB, AL. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Magnetic Tapes/*Muscles/*Physical Fitness/*Relaxation (Physiology)/* Video Data

MINS: / Evaluation/ Health/ Performance Tests/ Procedures/ Respiration/ Sources

ABA: Author (GRA)

ABSTRACT: The project consists of two parts, the written text and the videotape. The text describes how the project idea was formulated, the sources of data used, and how the videotape script was developed. The script describes the concept of relaxation techniques, and the techniques of deep breathing, progressive muscle relaxation, and visualization. Then through a short demonstration, the viewer has the opportunity to experience each of these three techniques. The videotape is used in the Air War College (AWC) noontime film series in conjunction with the AWC Executive Health Assessment and Fitness block of instruction. The videotape can, however, be used to introduce relaxation techniques to any adult.

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85N35614# ISSUE 24 PAGE 4132 CATEGORY 52 ***RPT#***: AD-A156200 USARIEM-M28/85 85/04/29 34 PAGES UNCLASSIFIED DOCUMENT

TITLE: An analysis of aerobic capacity in a large United States population

AUTHORS: A/Vogel, J. A.; B/Patton, J. F.; C/Mello, R. P.; D/Daniels, W. L.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Body Volume (Biology)/*Oxygen Consumption/*Physical Fitness/*Respiration

MINS: / Amount/ Armed Forces (United States)/ Demography/ Factor Analysis/ Females/ Males/ Personnel/ Populations/ Tasks/ United States

ABA: Author (GRA)

ABSTRACT: A description of aerobic capacity in a large U.S. population comprised of 1,514 males and 375 females is presented. Such influencing factors as age, training state, occupation and body composition were evaluated. The population consisted of new recruits entering the U.S. Army from civilian life as well as soldiers in a variety of assignments and physical training programs. Age ranged from 17 through 55. Aerobic capacity was determined as maximal oxygen uptake measured directly by the Douglas bag technique during a standard discontinuous treadmill running procedure with the exception of one older aged group. New male and female recruits, representing a young civilian population, entered the service with VO2 max of 51 and 37 ml/kg/BW/min, respectively, and thereafter

increased 5-10% during initial basic training. The difference between genders, 30% on an absolute basis, was 14% when expressed as a function of lean body mass. Aerobic capacity was less after occupational training and continued to decrease with age at an average yearly rate of 10%. Aerobic capacity varied with intensity of the occupational physical demand except in groups with significant physical training programs. This first large U.S. population study of aerobic capacity, using a direct treadmill procedure, demonstrates levels consistent with any previously reported population.

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85N24711# ISSUE 14 PAGE 2388 CATEGORY 52 ***RPT#***: AD-A150869 NAVHLTHRSCHC-84-38 84/08/00 55 PAGES UNCLASSIFIED DOCUMENT

TITLE: SPARTEN (Scientific Program of Aerobic and Resistance Training Exercise in the Navy): A total body fitness program for health and physical readiness TLSP: Interim Report

AUTHORS: A/Marcinik, E. J.

CORP: Naval Health Research Center, San Diego, CA. AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: United States--

MAJS: /*Exercise Physiology/*Military Operations/*Muscles/*Navy/*Personnel/* Physical Fitness

MINS: / Education/ Females/ Human Body/ Males/ Ships/ Tasks/ Weight (Mass)

ABA: DTIC

ABSTRACT: Based on data collected from several Navy male and female populations a SPARTEN (Scientific Program of Aerobic and Resistance Training Exercise in the Navy) physical training system was developed. The comprehensive exercise format was specifically designed to enhance the health and job performance of Navy men and women. Contents include a general description of all stretching and circuit weight training exercises as well as instruction on proper breathing and weight lifting techniques. In addition, basic and advanced conditioning programs tailored for both ship and shore installations are provided.

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85N19633# ISSUE 10 PAGE 1527 CATEGORY 52 ***RPT#***: AD-A148846 AD-F300518 USARIEM-M-9/85 84/12/05 46 PAGES UNCLASSIFIED DOCUMENT

TITLE: Assessment of muscle strength and prediction of lifting capacity in US Army personnel

AUTHORS: A/Wright, J. E.; B/Sharp, D. S.; C/Vogel, J. A.; D/Patton, J. F.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Females/*Males/*Muscular Strength/*Physical Fitness/*Prediction Analysis Techniques

MINS: / Exercise Physiology/ Materials Handling/ Standards/ Tables (Data)

ABA: DTIC

ABSTRACT: The purpose of this study was to determine muscular strength tests which would be appropriate for Army occupational selection and predictive of job lifting and lifting-carrying tasks. A maximum lift to 132 cm, dead lift to knuckle height and a short term self-paced maximal lift-and-carry were utilized as criterion tasks. Isometric strength measures

evaluated as predictors included: handgrip, knee extension, trunk extension, upper torso arm-shoulder pull down, standing upward pull at 38 cm and 132 cm height. Dynamic strength of the trunk extensors were also measured with an isokinetic dynamometer. Studies employed both male and female soldiers. Initial analysis selected six isometric strength measures plus lean body mass as potential predictors of the best criterion variable, maximum lift capacity to 132 cm (MSLC). Males and females formed separate populations (non-coincidence) in these measures so that gender could be represented by a numerical designator as a constituent variable in a single predictive equation. Handgrip, 38cm upright pull and upper torso pull down gave similar predictive power. Ridge regression techniques were utilized to compensate for multicollinearity effects among these predictors.

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85N17556# ISSUE 8 PAGE 1200 CATEGORY 54 ***RPT#***: AD-A148061 NAVHLTHRSCHC-84-31 84/07/00 30 PAGES UNCLASSIFIED DOCUMENT

TITLE: Cognitive performance during successive sustained physical work episodes TLSP: Interim Report

AUTHORS: A/Englund, C. E.; B/Ryman, D. H.; C/Naitoh, P.; D/Hodgdon, J. A.

CORP: Naval Health Research Center, San Diego, CA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Cognition/*Exercise Physiology/*Mental Performance/*Physical Work/*Sleep Deprivation

MINS: / Armed Forces (United States)/ Management Analysis/ Military Operations/ Perception/ Personnel/ Physical Fitness/ Psychology/ Tasks/ Time/ Treadmills/ Visual Perception

ABA: DTIC

ABSTRACT: During times of emergency, e.g., military operations, humans must often work continuously for long hours at physically demanding tasks while remaining mentally alert. In this repeated measures study, eleven pairs (one experimental and one control) of Marines (N=22) experienced one 12-hour baseline and two 20-hour continuous work episodes (CWE). The 20-hour CWEs were separated by five hours which included a 3-hour nap from 0400-0700. Each hour of CWE was split into two half-hour sessions. During the first half-hour subjects performed alpha-numeric (A-N) visual vigilance tasks. The experimental member of each pair spent this first 30 minutes also walking on a treadmill in full combat gear (25 kg) at approximately 30 percent max V02 heart rate for a total distance of approximately 114 km. The controls performed the A-N task sitting quietly at a video terminal. During the second half-hour, all subjects performed selected combinations of computer generated tasks. The results indicated that the exercise of treadmill walking did not accentuate sleep loss effects on the cognitive measures studied. Sleep loss (day differences) was significant for the visual vigilance task (CWl = 80.9%, correct CW2 = 70.6%).

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85N10607# ISSUE 1 PAGE 90 CATEGORY 52 84/06/00 15 PAGES In JAPANESE; ENGLISH summary UNCLASSIFIED DOCUMENT DCAF F012369

TITLE: The effects of isotonic training on +Gz tolerance

AUTHORS: A/Mizumoto, C.; B/Iwane, M.

CORP: Japanese Air Self-Defense Force, Tokyo (Japan). ***CSS***: (Aeromedical Lab.) AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01 In its The Repts. of Aeromedical Lab., Vol. 25, No. 1/2 p 15-30 (SEE N85-10605 01-51)

CIO: Japan--

MAJS: /*Acceleration (Physics)/*Acceleration Tolerance/*Human Tolerances/* Physical Exercise

MINS: / Males/ Muscles/ Muscular Strength

ABA: R.S.F.

ABSTRACT: The effects of isotonic training on the tolerance to + Gz were evaluated. Five healthy, sedentary men aged from 20 to 31 performed the weight training program consisting of nine exercises: leg press, bench press, back extension, chin up, leg curl, straight arm pulldown, shoulder shrug, sit up, and arm curl. The main results obtained include: (1) muscle strength including back strength, grip strength, and leg strength increased significantly with the training; (2) the tolerance to gradual onset run exposure increased by 0.4 to 0.9G in four subjects and did not change in one; (3) the tolerance to rapid onset run (ROR) exposure increased by 1.0 to 1.5G in two subjects, did not change in two, and decreased in one by 0.5G; and (4) the correlation between the tolerance to ROR exposure and the weight of one maximum repetition of leg press was statistically significant. It is concluded that the weight training, especially the leg press, was effective in improving the G tolerance.

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85N10605# ISSUE 1 PAGE 90 CATEGORY 51 ISSN 0023-2858 84/06/00 85 PAGES In ENGLISH and JAPANESE UNCLASSIFIED DOCUMENT DCAF F012369

TITLE: The Reports of Aeromedical Laboratory, volume 25, no. 1/2

CORP: Japanese Air Self-Defense Force, Tokyo (Japan). ***CSS***: (Aeromedical Lab.) AVAIL.CASI

SAP: Avail: CASI HC A05/MF A01

CIO: Japan--

MAJS: /*Acceleration (Physics)/*Acceleration Tolerance/*Air Traffic Controllers (Personnel)/*Aircraft Pilots/*Emotions/*Fatigue (Biology)/*Fear Of Flying /*Flight Stress (Biology)/*Human Factors Engineering/*Human Tolerances/* Inflating/*Personality/*Physical Exercise/*Pressure Suits

MINS: / Age Factor/ Anxiety/ Circadian Rhythms/ Fighter Aircraft/ Human Centrifuges/ Human Reactions/ Muscular Strength/ Pressure Regulators/ Psychological Tests/ Psychometrics/ Sleep/ Surveys/ Tension

ANN: The flying situations which induce emotional disturbances in pilots were determined. The effects of weight training on acceleration tolerance were evaluated. Psychological uneasiness and phobic tendencies in aircraft pilots were assessed. The inflating characteristics of an anti-G pressure suit for pilots were studied. The fatigue of air traffic controllers and other persons working shiftwork was measured. For individual titles see N85-10606 through N85-10610.

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84N34168# ISSUE 23 PAGE 3811 CATEGORY 54 ***RPT#***: AD-A143821 USARIEM-M-33/83 ***CNT#***: DA PROJ. 3E1-62777-A-879 84/06/30 24 PAGES UNCLASSIFIED DOCUMENT

TITLE: Upper to lower body muscular strength and endurance ratios for women and men
AUTHORS: A/Falkel, J. E.; B/Sawka, M. N.; C/Levine, L.; D/Pandolf, K. B.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Body Weight/*Endurance/*Females/*Human Body/*Kinetics/*Males/*Muscular Strength
MINS: / Fatigue (Biology)/ Mechanical Properties/ Physical Fitness/ Ratios
ABA: DTIC
ABSTRACT: This study examined possible gender differences for relative upper (elbow) to lower (knee) body strength and endurance, as well as relative flexion to extension strength and endurance. Seven women and nine men who were matched for both upper and lower body aerobic power were tested on an isokinetic strength instrument. Absolute isokinetic strength was lower ($p<0.01$) for the women than the men for all measurements. When strength was expressed per lean body weight, the women were weaker ($p<0.05$) only for elbow flexion strength. The women had a lower ($p<0.05$) upper to lower body strength ratio for flexion, but not for extension. There were also no differences ($p>0.05$) in isokinetic endurance fatigue decrements, or upper to lower body endurance ratios between genders. These data indicated that there were differences in absolute strength between the genders, but strength per lean body weight, as well as upper to lower body ratios for strength and endurance were similar for both genders. It was recommended that aerobic fitness and level of training be taken into account strength and endurance were compared between the genders.

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84N29454# ISSUE 19 PAGE 3066 CATEGORY 52 ***RPT#***: AD-A142330 USARIEM-M-26/84 ***CNT#***: DA PROJ. 3E1-62777-A-879 84/06/00 26 PAGES UNCLASSIFIED DOCUMENT
TITLE: Upper body exercise performance: Comparison between women and men
AUTHORS: A/Falkel, J. E.; B/Sawka, M. N.; C/Levine, L.; D/Pimental, N. A.; E/Pandolf, K. B.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Exercise Physiology/*Females/*Males/*Muscular Strength/*Physical Exercise
MINS: / Comparison/ Extremum Values/ Oxygen Consumption/ Physical Fitness
ABA: DTIC
ABSTRACT: This study compared upper body (arm crank) aerobic fitness for a group of women ($n = 8$) and men ($n = 9$) matched for lower body (cycle) aerobic fitness and also examined the influence selected physiological factors had on upper body exercise performance. The components of upper body exercise studied included maximal power output (PO max), peak oxygen uptake (peak VO2), upper body isokinetic strength and endurance, arm volume, and endurance time at 80% arm crank peak VO2. During maximal effort upper body exercise, there was no difference in peak VO2 between the genders despite the men's significantly greater strength, arm volume and PO max. There were no differences in upper body peak VO2 when the gender differences in arm volume were accounted for. Likewise, there was no difference in upper body endurance time at 80% peak VO2 between the genders. These data indicated that: (1) women do not have an inherent disadvantage to perform upper body exercise; (2) skeletal muscle strength provides a relatively minor

influence on both maximal effort and prolonged upper body exercise; (3) individuals can perform prolonged upper body exercise at relative intensities greater than that needed to elicit an aerobic training effect.

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84N29444# ISSUE 19 PAGE 3065 CATEGORY 52 ***RPT#***: AD-A141374 USARIEM-M-23/84 84/05/03 18 PAGES UNCLASSIFIED DOCUMENT

TITLE: Maximal power outputs during the Wingate anaerobic test

AUTHORS: A/Patton, J. F.; B/Murphy, M. M.; C/Frederick, F. A.

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Exercise Physiology/*Muscles/*Muscular Strength

MINS: / Calibrating/ Human Performance/ Males/ Muscular Function/ Output

ABA: DTIC

ABSTRACT: The purpose of this study was to determine the resistance settings which elicit maximal values of power output (PO) values during performance of the Wingate Test (WT). Nineteen male subjects performed multiple WT in a random order at resistance settings ranging from 0.055 to 0.115 kg/kg BW. Tests were carried out on a Monark cycle ergometer modified to permit instantaneous application of resistance. Revolutions were determined by a computer interfaced frequency counter. The mean resistance settings eliciting the highest peak power (PPO) and mean power (MPO) outputs were 0.096 and 0.094 kg/kg BW, respectively (average setting of 0.095 kg/kg BW). Both PPO and MPO were significantly higher (15.5% and 13.0%, respectively) using a resistance setting of 0.095 compared to the Wingate setting of 0.075 kg/kg BW. The test-retest reliability for PPO and MPO ranged between 0.91 and 0.93 at both resistance settings. Body weight, % body fat and thigh volume did not significantly estimate the individual resistance settings eliciting maximal PO's. The data suggest that resistance be assigned according to the subjects BW but consideration be given to increasing this resistance from that presently used in various laboratories.

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84N28424# ISSUE 18 PAGE 2905 CATEGORY 53 ***RPT#***: AD-P003257 84/04/00 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical performance tests as predictors of task performance

AUTHORS: A/Doolittle, T. L.; B/Spurlin, O. L.; C/Scontrino, M. P.

CORP: Washington Univ., Seattle, WA. AVAIL.CASI

SAP: Avail: CASI HC A01/MF A06 In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 105-109 (SEE N84-28403 18-53)

CIO: United States--

MAJS: /*Exercise Physiology/*Fatigue (Biology)/*Oxygen Metabolism/*Physical Fitness/*Physiological Tests/*Prediction Analysis Techniques/*Workloads (Psychophysiology)

MINS: / Armed Forces (United States)/ Communication/ Conferences/ Formulas (Mathematics)/ Heart Rate/ Management Analysis/ Muscular Tonus/ Performance Tests/ Personnel/ Physical Examinations/ Productivity/ Tasks

ABA: DTIC

ABSTRACT: The more arduous the task, the greater the intensity of force which must be applied per unit of time to overcome resistance or achieve rate. Intensity is commonly called workload with magnitude expressed in appropriate units of power. Two complex factors determine the limits for which an individual can produce energy and generate the requisite power: (1) capacity to utilize oxygen, and (2) ability to generate muscular tension. The former is called aerobic power and the latter strength. From the foregoing discussion it can be seen that it is impossible to replicate the significant components of physically demanding occupations. If a test can be demonstrated to represent important job components it is valid to use the test in applications such as preemployment screening. Nevertheless, because of the legal guidelines and changing professional standards surrounding test validation, there are some important issues to consider in order to firmly establish the defensibility of a physical performance test.

END SEQUENCE EXECUTION

ENTER:ENTER:t 75/2/199-240

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84N28421# ISSUE 18 PAGE 2905 CATEGORY 53 ***RPT#***: AD-P003254 84/04/00 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: A questionnaire assessment of estimated radiation effects upon military task performance

AUTHORS: A/Glickman, A. S.; B/Winne, P. S.; C/Morgan, B. B., Jr.; D/Moe, R. B.

CORP: Organization Research Group of Tidewater, Inc., Norfolk, VA. AVAIL.CASI

SAP: Avail: CASI HC A01/MF A06 In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 90-94 (SEE N84-28403 18-53)

CIO: United States--

MAJS: /*Dehydration/*Fatigue (Biology)/*Human Performance/*Performance Tests/* Radiation Effects/*Radiation Sickness/*Tolerances (Physiology)

MINS: / Armed Forces (United States)/ Assessments/ Clinical Medicine/ Combat/ Communicating/ Communication/ Conferences/ Data Acquisition/ Degradation/ Estimates/ Estimating/ Losses/ Military Psychology/ Mission Planning/ Personnel/ Physical Fitness/ Radiology/ Research Management/ System Effectiveness/ Tasks

ABA: DTIC

ABSTRACT: One hundred twenty five supervisors in four types of U.S. Army combat systems estimated the degree of degradation of military tasks for 30 descriptive symptom complexes associated with various radiation exposures. Results indicated that: (1) the relative order of symptom effects were highly consistent across positions and the types of systems, (2) performances were expected to be deleteriously affected under most illness conditions, even mild ones, but incapacitation was not anticipated until illness conditions became quite severe, and (3) the most important factors in estimating performances were fluid loss and fatigability/weakness.

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84N28396# ISSUE 18 PAGE 2900 CATEGORY 52 ***RPT#***: AD-A140971 NAVHLTHRSCHC-84-6 ***CNT#***: M00-96-PN 84/01/00 14 PAGES UNCLASSIFIED DOCUMENT

TITLE: Aerobic/calisthenic and aerobic/circuit weight training programs for Navy men: A comparative study ***TLSP***: Interim Report

AUTHORS: A/Marcinik, E. J.; B/Hodgdon, J. A.; C/Mittleman, K.; D/Obrien, J. J.

CORP: Naval Health Research Center, San Diego, CA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Muscular Strength/*Physical Fitness
MINS: / Armed Forces (United States)/ Education/ Human Beings/ Males/ Personnel/ Physical Exercise
ABA: Author (GRA)
ABSTRACT: Analyses of generic shipboard work tasks indicate that the majority of assigned duties involve heavy lifting, carrying, pushing, and pulling efforts. Findings of this investigation show that aerobic/circuit weight training elicited significantly higher scores than aerobic/calisthenic training for the majority of upper and lower torso muscular strength measures. These data suggest that a 15-minute circuit weight training regimen be considered to augment current Navy aerobic oriented physical conditioning programs for enhanced physical readiness.

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84N28380# ISSUE 18 PAGE 2897 CATEGORY 52 84/06/04 1 PAGES UNCLASSIFIED DOCUMENT
TITLE: Effects of short-term heat adaptation on certain indicators of physical capacity for work ***TLSP***: Abstract Only
AUTHORS: A/Kachanovskiy, K. N.
CORP: Joint Publications Research Service, Arlington, VA. AVAIL.CASI
SAP: Avail: CASI HC A01/MF A02 In its USSR Rept.: Life Sci., Biomed. and Behavioral Sci. (JPRS-UBB-84-011) p 73 (SEE N84-28364 18-51)
CIO: USSR Transl. Into ENGLISH From Fiz. Cheloveka (Moscow), V. 10, No. 1,-- Jan. - Feb. 1984 P 163-165
MAJS: /*Exercise Physiology/*Heat Acclimatization/*Human Tolerances/* Physiological Effects/*Physiological Tests/*Work Capacity
MINS: / Biometrics/ Fatigue (Biology)/ Muscular Strength/ Physiological Responses/ Respiratory Rate/ Stress (Physiology)
ABA: M.A.C.
ABSTRACT: The effects of short term heat adaptation on the capacity to perform physical work evaluated in he case of eight 28 to 30 year old males exposed to temperatures of 48 C for 2 h per day for 5 days, in combination with periods of activity on an exercise cycle. Before and after each heat exposure, measurements are made of the time required to attain a speed of 60 rpm on an exercise cycle with a 450 W load, and of several physiological parameters. After the 5-day period, muscular strength increased by 19.3% over initial value, while tolerance of static exertion equal to 2/3 of maximum muscle strength decreased, on the average, from 16.43 to 7.96%, resulting in a concomitant decrease in the absolute work capacity coefficient from 2.0 to 1.4.

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84N27416*# ISSUE 17 PAGE 2743 CATEGORY 52 ***RPT#***: NASA-CR-3796 NAS 1.26:3796 ***CNT#***: NASW-3728 84/04/00 90 PAGES UNCLASSIFIED DOCUMENT
TITLE: Research opportunities in muscle atrophy ***TLSP***: Final Report
AUTHORS: A/Herbison, G. J.; B/Talbot, J. M. ***PAA***: A/(Thomas Jefferson Univ. Hospital, Philadelphia) ***PAT***: A/ed.; B/ed.

CORP: Federation of American Societies for Experimental Biology, Bethesda, MD. AVAIL.CASI
SAP: Avail: CASI HC A05/MF A01
CIO: United Stateswashington Nasa--
MAJS: /*Aerospace Medicine/*Atrophy/*Hypokinesia/*Muscular Strength/* Musculoskeletal System/*Weightlessness
MINS: / Biochemistry/ Biomedical Data/ Clinical Medicine/ Exercise Physiology/ Muscular Function/ Space Flight
ABA: M.A.C.
ABSTRACT: Muscle atrophy in a weightless environment is studied. Topics of investigation include physiological factors of muscle atrophy in space flight, biochemistry, countermeasures, modelling of atrophied muscle tissue, and various methods of measurement of muscle strength and endurance. A review of the current literature and suggestions for future research are included.

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84N17824# ISSUE 8 PAGE 1200 CATEGORY 52 ***RPT#***: AD-A134672 USARIEM-M-9/83 ***CNT#***: DA PROJ. 3E1-62777-A-879 83/10/00 8 PAGES UNCLASSIFIED DOCUMENT
TITLE: Overuse injuries of the lower extremities associated with marching, jogging and running. A review
AUTHORS: A/Jones, B. H.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A01
CIO: United States Repr. From Military Medicine, V. 148, Oct. 1983 P 783-787--
MAJS: /*Armed Forces (United States)/*Boots (Footwear)/*Education/*Exercise Physiology/*Females/*Injuries/*Limbs (Anatomy)/*Physical Exercise
MINS: / Bones/ Males/ Physical Fitness/ Running/ Shoes
ABSTRACT: Army basic trainees who wore boots through one seven-week basic training cycle were studied. Exercise-related and performance-limiting conditions in female trainees were emphasized. Some comparative data were collected on injuries among male counterparts of these females. The overall incidence of lower extremity injuries to females was 62 percent (215 of 347) and for males 26 percent (202 of 770). The average injury sustained by these women resulted in 13 days of less training time.

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84N14666# ISSUE 5 PAGE 712 CATEGORY 52 ***RPT#***: AD-A132550 AFIT/CI/NR-83-24T 83/00/00 61 PAGES UNCLASSIFIED DOCUMENT
TITLE: Electromyographic analysis of the peroneous longus during bicycle ergometry across work load and pedal type ***TLSP***: M.S. Thesis - North Carolina Univ.
AUTHORS: A/Holt, D. L.
CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH. AVAIL.CASI
SAP: HCA04/MFA01
CIO: United States--
MAJS: /*Electromyography/*Injuries/*Muscular Strength/*Pedals/*Physical Exercise /*Workloads (Psychophysiology)
MINS: / Cycles/ Ergometers/ Fatigue (Biology)/ Feet (Anatomy)/ Leg (Anatomy)
ABA: DTIC

ABSTRACT: Lateral ankle injuries often result in residual disability. Increasing the endurance of the peroneous longus may reduce this problem. Bicycle ergometry may increase the endurance of the peroneous longus, but the activity of the peroneous longus during pedaling is not known. The purpose of this study was to analyze the electromyographic (EMG) activity of the peroneous longus across work load (1, 2, and 3 Kp) and pedal type (standard and medial support only) during pedaling. The analysis included total, peak, and phasic EMG activity per cycle. EMG activity was monitored with bipolar surface electrodes arranged in a longitudinal configuration over the motor points. The pedaling cycle was monitored with a photo electric cell and the gait cycle was monitored with a heel switch. Gait data were used to normalize the pedaling data. Data from nineteen muscles were collected from eleven subjects, all adult males. Results indicated that: (1) increasing work load significantly increases the total, peak, and phasic EMG activity; (2) modified pedals significantly increase the total, peak, and phasic EMG activity; (3) the interaction between work load and pedal type significantly increases the total and peak EMG activity; and (4) only pedaling with modified pedals results in EMG activity comparable to gait.

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83N35638# ISSUE 23 PAGE 3848 CATEGORY 53 ***RPT#***: AD-A128294 83/04/08 20 PAGES UNCLASSIFIED DOCUMENT

TITLE: What are little girls made of?

AUTHORS: A/Boening, S. S.

CORP: Army War Coll., Carlisle Barracks, PA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Armed Forces (United States)/*Females/*Management Planning/*Personnel

MINS: / Fatigue (Biology)/ Group Dynamics/ Human Behavior/ Military Operations/ Physical Fitness/ Psychology/ Tasks/ Tolerances (Physiology)

ABA: DTIC

ABSTRACT: Since the demise of the Women's Army Corps; the Army has suffered from the absence of a basic philosophy on the proper utilization of women. Four possible ways of looking at the role of women in the society and Army are examined. The Army needs to select one as a consistent base for logical, explainable policy.

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83N32295# ISSUE 20 PAGE 3343 CATEGORY 52 ***RPT#***: AD-A128067 83/05/00 93 PAGES UNCLASSIFIED DOCUMENT

TITLE: Comparison of weight training and calisthentic exercise programs in developing strength and muscular endurance in United States Army recruits TLSP: M.S. Thesis. Final Report

AUTHORS: A/Boyko, R. G.

CORP: Army Military Personnel Center, Alexandria, VA. AVAIL.CASI

SAP: Avail: CASI HC A05/MF A01

CIO: United States--

MAJS: /*Armed Forces (United States)/*Exercise Physiology/*Muscular Strength/* Physical Exercise

MINS: / Endurance/ Military Operations/ Physical Fitness/ Training Analysis

ABA: DTIC

ABSTRACT: This investigation attempted to find the most effective program for developing upper body strength and muscular endurance by comparing the effectiveness of the current Army physical training program used in Initial Entry training with four other supplemental programs. The subjects for this investigation were 214 Army recruits. The subjects were divided into five groups: the current Army training program group, an alternate day calisthenics group, a daily calisthenics group, an alternate day weight training group, and a daily weight training group. The soldiers in all five groups were tested on the pushup test, the one-repetition maximum bench press test, and the 75 percent of one repetition maximum bench press test. The tests were given on three occasions: before the start of training, in the middle of the training period, and at the conclusion of the seven-week training period. The results of the investigation showed that there were no significant differences between the five groups on the pushup test at the end of the seven-week training period. There were significant differences between both weight training groups and the alternate day calisthenic group on the bench press tests. There were no significant differences between the daily and alternate day training groups on any of the three tests at the end of the seven-week training period.

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83N27585# ISSUE 16 PAGE 2628 CATEGORY 52 ***RPT#***: AD-A124976 M5/83 83/00/00 29 PAGES UNCLASSIFIED DOCUMENT

TITLE: Angular specificity and test mode specificity of isometric and isokinetic strength training

AUTHORS: A/Knapik, J. J.; B/Mawdsley, R. H.; C/Ramos, M. U. ***PAA***: B/(Northern Illinois Univ.); C/(Boston Univ. Hospital)

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. ***CSS***: (Exercise Physiology Div.) AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States Submitted For Publication--

MAJS: /*Exercise Physiology/*Muscular Strength

MINS: / Angles (Geometry)/ Contraction/ Dynamometers/ Efferent Nervous Systems/ Joints (Anatomy)/ Physical Fitness/ Physiological Responses/ Transfer Of Training

ABA: Author (GRA)

ABSTRACT: Six males and six females (X = 22.6 years) were assigned to groups which trained either isometrically (90 deg) or isokinetically (30 deg/sec). They trained their left elbow extensors at 80 percent of their maximum voluntary contraction on a modified Cybex apparatus for 10 weeks, three sessions per week, with 50 contractions per session. Before and after training, both groups were tested isometrically (70 deg, 90 deg, 110 deg) and isokinetically (30 deg/sec). When tested isometrically, both groups improved equally, and strength was increased at all three test angles to about the same extent. When tested isokinetically, both groups improved, but the isokinetic group improved to a greater extent. In conclusion, no angular specificity of training was demonstrated within 20 deg of the training angle, and no test mode specificity was seen for isometric testing. However, isometric training showed less transfer to an isokinetic test.

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83N27584# ISSUE 16 PAGE 2628 CATEGORY 52 ***RPT#***: AD-A124965 82/00/00 26 PAGES UNCLASSIFIED DOCUMENT

TITLE: Recovery from short term intense exercise: its relation to capillary supply and lactate release
AUTHORS: A/Tesch, P. A.; B/Wright, J. E. ***PAA***: A/(Karolinska Hospital)
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Blood/*Capillaries/*Exercise Physiology/*Lactates
MINS: / Concentration (Composition)/ Contraction/ Extremum Values/ Fatigue (Biology)/ Muscles/ Muscular Strength/ Physical Fitness/ Stress (Physiology)/ Torque
ABA: DTIC
ABSTRACT: Muscle force recovery from short term intense exercise was examined in 16 physically active men. They performed 50 consecutive maximal voluntary knee extensions. Following a 40 s rest period 5 additional maximal contractions were executed. The decrease in torque during the 50 contractions and the peak torque during the 5 contractions relative to initial torque were used as indicies for fatigue and recovery, respectively. Venous blood samples were collected repeatedly up to 8 min past exercise for subsequent lactate analyses. Muscle biopsies were obtained from m. vastus lateralis and analysed for fiber type composition, fiber are and capillary density. Peak torque decreased 67 (range 47-82)% as a result of the repeated contractions. Lactate concentration after the 50 contractions was 2.9 + or - 1.3 m/mol and the peak post exercise value averaged 8.7 + or - 2.1 m/mol. Based on the present findings it is suggested that lactate elimination from the exercising muscle is dependent upon the capillary supply and influences the rate of muscle force recovery.

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83N20564*# ISSUE 10 PAGE 1586 CATEGORY 54 ***RPT#***: NASA-CR-167807 NAS 1.26:167807 ***CNT#***: NAS9-16136 82/12/31 51 PAGES UNCLASSIFIED DOCUMENT
TITLE: Analysis of physical exercises and exercise protocols for space transportation system operation ***TLSP***: Final Report, 1 Sep. 1980 - 31 Dec. 1982
AUTHORS: A/Coleman, A. E.
CORP: Houston Univ., Clear Lake, TX. AVAIL.CASI
SAP: Avail: CASI HC A04/MF A01
CIO: United States--
MAJS: /*Aerospace Environments/*Physical Exercise/*Treadmills/*Weightlessness
MINS: / Muscular Strength/ Physiological Effects
ABA: S.L.
ABSTRACT: A quantitative evaluation of the Thornton-Whitmore treadmill was made so that informed management decisions regarding the role of this treadmill in operational flight crew exercise programs could be made. Specific tasks to be completed were: The Thornton-Whitmore passive treadmill as an exercise device at one-g was evaluated. Hardware, harness and restraint systems for use with the Thornton-Whitmore treadmill in the laboratory and in Shuttle flights were established. The quantitative and qualitative performance of human subjects on the Thorton-Whitmore treadmill with forces in excess of one-g, was evaluated. The performance of human subjects on the Thornton-Whitmore treadmill in weightlessness (onboard Shuttle flights) was also determined.

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83N20542# ISSUE 10 PAGE 1582 CATEGORY 52 ***RPT#***: AD-A120708 SA-TR-82-33 ***CNT#***: AF PROJ. 7930 82/09/00 12 PAGES UNCLASSIFIED DOCUMENT

TITLE: Some biochemical indices of mild physical stress: A preliminary study TLSP: Final Report, Oct. 1980 - May 1981

AUTHORS: A/Ellis, J. P., Jr.; B/Reader, D. C.; C/Fischer, J. R., Jr.; D/Wease, D. F.

CORP: School of Aerospace Medicine, Brooks AFB, TX. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Biochemistry/*Exercise Physiology/*Hematology/*Stress (Physiology)

MINS: / Epinephrine/ Males/ Medical Science/ Physical Fitness/ Tasks

ABA: DTIC

ABSTRACT: Toward establishing an analytical capability for quantifying the physical demands of job stress, the effectiveness of an experimental protocol was ascertained in a group of healthy men. The protocol featured measurement of epinephrine (E), norepinephrine (NE), and cortisol in blood drawn moments before and after 3 discrete levels of treadmill exercise. An added feature was testing of subjects with differing degrees of physical fitness (as adjudged by exercise habits). Although ways of enhancing the protocol's effectiveness were identified, the following definitive findings emerged: (1) plasma NE concentrations were the most sensitive to workload and differentiated fitness subgroups, (2) plasma E levels were slightly less sensitive to workload and did not differentiate as well fitness subgroups, and (3) evidence of adrenocortical stimulation was found only at the highest exercise level, and only for the less fit subjects. Exercise-induced changes in plasma NE correlated well (r=0.861) with concomitant changes in blood lactate (reported elsewhere), suggesting the 2 indices might collectively distinguish physical from cognitive or emotional demands in various work environs.

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82N30927*# ISSUE 21 PAGE 3024 CATEGORY 52 ***RPT#***: NASA-TM-76883 NAS 1.15:76883 ***CNT#***: NASW-3541 82/05/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT Original language document announced as A82-15712

TITLE: Control of muscle activity in unloaded conditions

AUTHORS: A/Kovalik, A. V.

CORP: National Aeronautics and Space Administration, Washington, DC.

SAP: Avail: NASA Scientific and Technical Information Facility, P.O. Box 8757, B.W.I. Airport, Md. 21240

CIO: USSR Transl. By Kanner (Leo) Associates, Redwood City, Calif. Transl.-- Into ENGLISH From Gig. Tr. Prof. Zabol. (USSR), No. 8, Aug. 1981 P 44-45

MAJS: /*Human Factors Engineering/*Muscular Strength/*Muscular Tonus/*Physical Exercise

MINS: / Homeostasis/ Hypotonia/ Musculoskeletal System/ Physiological Tests/ Tensile Stress

ABA: E.A.K.

ABSTRACT: The ability of human test subjects to voluntarily tense specific muscle groups was. It was shown that less tension is generated than in overcoming an external load and that muscles of the upper half of the body are generally more controllable and generate greater tension than those of the lower half of the body. It is also noted that voluntary muscle tension can be generated in any sequence of muscle groups and for at least 3 hours continuously. It is found that 2 weeks of training produces greatly improved precision and selectivity on muscle tensing.

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82N26992# ISSUE 17 PAGE 2456 CATEGORY 54 ***RPT#***: AD-A110630 USARIEM-M-8/82 82/01/11 22 PAGES UNCLASSIFIED DOCUMENT

TITLE: Anatomic perspective of the female athlete: An approach to musculoskeletal profiling of women in sports

AUTHORS: A/Bauman, C.; B/Knapik, J. J.; C/Jones, B. H.; D/Harris, J. M.; E/Vaughn, L. K.
PAA: A/(Wellesley Coll.); D/(Veterans Administration Hospital, Boston)

CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States--

MAJS: /*Athletes/*Females/*Musculoskeletal System/*Orthopedics

MINS: / Body Measurement (Biology)/ Injuries/ Joints (Anatomy)/ Muscular Strength/ Physical Exercise/ Standards/ Wound Healing

ABA: DTIC

ABSTRACT: Women's sports did not begin to grow and gain public recognition until the early 1970's. Since then, the number of women participating in intercollegiate sports has doubled and the number of girls participating in interscholastic sports programs has increased almost threefold. As women flood the sports arena, many questions arise regarding the female athlete. Their performance capabilities are constantly compared with male athletic records and standards, and explanations for the difference in their level of performance are being sought.

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81N26701# ISSUE 17 PAGE 2379 CATEGORY 52 81/03/00 4 PAGES UNCLASSIFIED DOCUMENT

TITLE: Changes in physical fitness due to variations in physical activity and diet

AUTHORS: A/Andersen, H. T.; B/Myhre, K.

CORP: Institute of Aviation Medicine, Manching (Germany). AVAIL.CASI

SAP: Avail: CASI HC A01/MF A02 In AGARD The Effect of Long-Term Therap., Prophylaxis and Screening Tech. on Aircrew Med. Standards 4 p (SEE N81-26699 17-52)

CIO: Norway--

MAJS: /*Body Weight/*Degeneration/*Flight Crews/*Heart Diseases/*Oxygen Metabolism/*Physical Fitness

MINS: / Aerospace Medicine/ Deterioration/ Health/ Pilots (Personnel)

ABA: S.F.

ABSTRACT: Physical deterioration in 122 young pilots and navigators of the Royal Norwegian Air Force was studied over the 5-year period 1972-1977. A net gain in body weight with no simultaneous increase in aerobic capacity was interpreted as an early, but serious, sign of physical degeneration.

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81N26700# ISSUE 17 PAGE 2379 CATEGORY 52 81/03/00 7 PAGES UNCLASSIFIED DOCUMENT

TITLE: Physical fitness and cardiovascular capacity: An epidemiological program

AUTHORS: A/Myhre, K.; B/Alnaes, E.; C/Andersen, H. T.

CORP: Institute of Aviation Medicine, Oslo (Norway). AVAIL.CASI

SAP: Avail: CASI HC A02/MF A02 In AGARD The Effect of Long-Term Therap., Prophylaxis and Screening Tech. on Aircrew Med. Standards 7 p (SEE N81-26699 17-52)
CIO: Norway--
MAJS: /*Cardiovascular System/*Heart Diseases/*Physical Exercise/*Physical Fitness
MINS: / Aerospace Medicine/ Cholesterol/ Epidemiology/ Habits/ Health/ Serums
ABA: S.F.
ABSTRACT: A longitudinal survey was conducted of the way of living of all personnel with flying status in terms of diet, smoking and drinking habits, and habitual physical activity, in addition to anthropometrical/physiological parameters such as weight, percentage of fat, maximal aerobic power, serum concentrations of triglycerides, total cholesterol and HDL cholesterol. This information is obtained from each subject during his periodical major medical examination at the Institute of Aviation Medicine, which is every sixth year when the subject is below 40 yrs of age, otherwise every third year. This program is discussed.

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81N26694 ISSUE 17 PAGE 2378 CATEGORY 52 80/00/00 101 PAGES UNCLASSIFIED DOCUMENT
TITLE: Evaluation of human power capacity through olympic weightlifting analyses TLSP: Ph.D. Thesis
AUTHORS: A/Garhammer, J. J., Jr.
CORP: California Univ., Los Angeles, CA.
SAP: Avail: Univ. Microfilms Order No. 8111224
CIO: United States--
MAJS: /*Human Factors Engineering/*Human Performance/*Limbs (Anatomy)/* Musculoskeletal System/*Physical Exercise/*Physiology
MINS: / Athletes/ Elastodynamics/ Human Body/ Muscular Strength/ Sensorimotor Performance
ABA: Dissert. Abstr.
ABSTRACT: Magnitudes of human output for various phases of the competitive lifting movements were studied. The power capacity exhibited consistencies associated with the corresponding movement speeds related to the classical force velocity (F-V) relationship for skeletal muscle. Energy flow analysis of olympic lifting movements indicates the primary importance of leg and hip musculature as is the case for jumping. The concept of stored elastic energy was utilized to explain the high power output for the relatively slow jerk thrust movement. It was found that in addition to training, one reason for the near maximal power outputs of olympic lifters is the utilization of previously stored elastic energy.

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81N16723*# ISSUE 7 PAGE 953 CATEGORY 52 ***RPT#***: NASA-TM-76307 ***CNT#***: NASW-3199 80/08/00 9 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
TITLE: Ways of increasing muscular activity by means of isometric muscular exertion
AUTHORS: A/Kovalik, A. V.
CORP: National Aeronautics and Space Administration, Washington, DC. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A01
CIO: USSR Transl. By Kanner (Leo) Associated, Redwood City, Calif. Original-- Doc. Prep. By Penza Factory Higher To Technical Inst., USSR Transl. Into ENGLISH From Teor. I Prakt. Fizicheskoy Kultury (USSR), No. 12, Dec. 1979 P 38-40

MAJS: /*Exercise Physiology/*Hypodynamia/*Physical Exercise/*Physiological Effects
MINS: / Muscular Strength/ Muscular Tonus
ABA: E.D.K.
ABSTRACT: The effect of isometric muscular exertion on the human body was investigated by having subjects perform basic movements in a sitting position in the conventional manner with additional muscle tension at 50% maximum force and at maximum force. The pulse, arterial pressure, skin temperature, respiratory rate, minute respiratory volume and electrical activity of the muscles involved were all measured. Performance of the exercises with maximum muscular exertion for 20 sec and without movement resulted in the greatest shifts in these indices; in the conventional manner substantial changes did not occur; and with isometric muscular exertion with 50% maximum force with and without movement, optimal functional shifts resulted. The latter is recommended for use in industrial exercises for the prevention of hypodynamia. Ten exercises are suggested.

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80N29028# ISSUE 19 PAGE 2613 CATEGORY 52 ***RPT#***: AD-A083576 AFOSR-80-0263TR ***CNT#***: F49620-79-C-0109 AF PROJ. 2313 80/01/00 85 PAGES UNCLASSIFIED DOCUMENT
TITLE: A technique for establishing true levels of muscle strength exertion TLSP: Final Report, 1 Jun. 1979 - 31 Jan. 1980
AUTHORS: A/Kroemer, K. H. E.; B/Marras, W. S.
CORP: Wayne State Univ., Detroit, MI. ***CSS***: (Ergonomics Research Lab.) AVAIL.CASI
SAP: Avail: CASI HC A05/MF A01
CIO: United States--
MAJS: /*Human Performance/*Muscular Strength/*Physiological Tests
MINS: / Analogs/ Females/ Males/ Personnel Selection/ Tables (Data)
ABA: DTIC
ABSTRACT: Experiments were performed with 20 female and 20 male subjects in order to determine indicators of whether the subjects performed maximal or submaximal isometric strength exertion. The exertion tested were elbow flexion, finger flexion, knee flexion and knee extension. The only performance measures used were analog recordings of the strength scores exerted on a static dynamometer. The following was found: (1) The variability of tests scores in repeated exertion is not a viable indicator of the actual portion of individual strength exerted. (2) The buildup phase of strength exertion is a reliable indicator of the force level to be attained. The steeper the strength formation curve, the stronger the following muscle strength exertion.

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80N18696 ISSUE 9 PAGE 1184 CATEGORY 52 79/00/00 77 PAGES UNCLASSIFIED DOCUMENT
TITLE: Muscular force-velocity alterations consequent to slow and fast velocity power training ***TLSP***: Ph.D. Thesis
AUTHORS: A/Coyle, E. F.
CORP: Arizona Univ., Tucson, AZ.
SAP: Avail: Univ. Microfilms Order No. 8003049
CIO: United States--
MAJS: /*Muscular Strength/*Physical Exercise/*Physical Fitness/*Physiological Effects

MINS: / Biodynamics/ Force/ Power/ Torque/ Velocity/ Workloads (Psychophysiology)
ABA: Dissert. Abstr.
ABSTRACT: Muscular force-velocity alterations were compared to slow and fast velocity power training. Active males trained the knee extensors of both legs simultaneously for six weeks, three times per week, by attempting to generate maximal peak torque (MPT) with each repetition at velocities of 60 deg/sec (MPT/60), 300 deg/sec (MPT/300), or both. Fast training significantly improved MPT uniformly (16-21%) at the training velocity as well as at slower velocities. Only the MPT/180 and MPT/300 improvements contained a significant physiological component of adaptation. High tension producing contractions appear necessary to improve MPT/slow while fast training velocities must be employed to improve MPT/fast. Fast training improves MPT in the mid-velocities more effectively than does slow training.

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80N14694# ISSUE 5 PAGE 643 CATEGORY 52 ***RPT#***: AD-A072671 79/06/00 80 PAGES UNCLASSIFIED DOCUMENT
TITLE: A consideration of factors contributing to strength differences in men and women ***TLSP***: M.S. Thesis
AUTHORS: A/Printy, T. M.
CORP: Naval Postgraduate School, Monterey, CA. AVAIL.CASI
SAP: Avail: CASI HC A05/MF A01
CIO: United States--
MAJS: /*Females/*Males/*Muscular Strength/*Physiological Factors
MINS: / Body Weight/ Heart Rate/ Human Performance/ Physical Fitness/ Sex Factor / Work Capacity
ABA: DTIC
ABSTRACT: The expansion of opportunities for women in today's military has increased the importance of understanding how and why men and women differ in strength, stamina, and work capacity. The present effort discusses how the different physiological/anatomical characteristics of the sexes form a basis for physical strength differences. Other factors, such as age, stature, weight, cultural influences, biomechanics, and training contribute to the significant differences in physical strength capabilities which are demonstrated both as to scope and degree. With an understanding of the strength capabilities of men and women and a comprehensive understanding of job requirements, the effective and efficient utilization of both sexes may be achieved.

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80N13765# ISSUE 4 PAGE 517 CATEGORY 52 ***RPT#***: AD-A068684 USARIEM-T-2/79 79/01/09 44 PAGES UNCLASSIFIED DOCUMENT
TITLE: Development and description of a device for static strength measurement in the armed forces examination and entrance station
AUTHORS: A/Knapik, J.; B/Kowal, D.; C/Riley, P.; D/Wright, J.; E/Saoco, M.
CORP: Army Research Inst. of Environmental Medicine, Natick, MA. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Muscular Strength/*Physical Fitness/*Static Tests
MINS: / Biodynamics/ Stress (Physiology)/ Tensometers

ABA: DTIC

ABSTRACT: A device for muscular strength measurement designed for possible use in the AFEES is presented. Muscle groups involving the upper body, legs and trunk, were selected for measurement as being most representative of the functional muscle groups most relevant to the Army's needs. The isometric (static) mode of testing was selected due to its simplicity of administration, reliability and reduced susceptibility to motivational influences. Biomechanical factors including subject-machine couplings, anatomical angles and minimization of synkinetic movement patterns are considered. The apparatus and calibration techniques are described. Standardized postures, anatomical angles and instructions are included. Reliability coefficients of 0.97, 0.92 and 0.83 were obtained for the upper body, legs and trunk respectively. Descriptive statistics and histograms for a representative population are included.

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79N29790 ISSUE 20 PAGE 2714 CATEGORY 52 79/00/00 224 PAGES UNCLASSIFIED DOCUMENT

TITLE: Isometric strength testing in selecting workers for strenuous jobs ***TLSP***: Ph.D. Thesis

AUTHORS: A/Keyserling, W. M.

CORP: Michigan Univ., Ann Arbor, MI.

SAP: Avail: Univ. Microfilms Order No. 7916744

CIO: United States--

MAJS: /*Human Factors Engineering/*Labor/*Manpower/*Muscular Strength

MINS: / Accidents/ Human Resources/ Industrial Plants/ Injuries/ Research Management

ABA: Dissert. Abstr.

ABSTRACT: Research was conducted to determine if strength testing can be used to reduce occupational illness and injuries which result from a mismatch between the strength abilities of workers and the strength demands of their jobs. To accomplish this, two field studies were performed in industrial plants. It was concluded that strength testing can be used to identify workers who would be at increased risk of suffereing a medical incident if placed on jobs with strength demands above their strength abilities.

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78N32723# ISSUE 23 PAGE 3123 CATEGORY 54 ***RPT#***: MEMO-33 77/11/00 52 PAGES UNCLASSIFIED DOCUMENT DCAF F090270

TITLE: Pull force capabilities for parachute ripcord release

AUTHORS: A/Bullock, M. I. ***PAA***: A/(Queensland Univ., Brisbane, Australia)

CORP: Department of Transport and Civil Aviation, Melbourne (Australia). ***CSS***: (Aviation Medicine Branch.) AVAIL.CASI

SAP: Avail: CASI HC A04/MF A01

CIO: Australia--

MAJS: /*Females/*Muscular Strength/*Parachute Descent/*Pulling/*Releasing

MINS: / Aerospace Medicine/ Equipment Specifications/ Human Factors Engineering/ Loads (Forces)/ Physiological Tests

ABA: G.G.

ABSTRACT: The pull force capabilities of female parachutists in positions relevant to ripcord release were assessed. Pull forces which can be exerted for period of 0.25, 1, 1.5, 2 and 2.5 seconds during a 5 second pull are presented in percentile form. The relatively low level of

strength exhibited by the weakest groups of the population emphasizes the need for such basic information in equipment design.

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77N23734# ISSUE 14 PAGE 1893 CATEGORY 52 77/05/04 6 PAGES UNCLASSIFIED DOCUMENT

TITLE: Evaluation of effectiveness of muscular electrostimulation for the prevention of disorders related to prolonged restriction of motor activity in man

AUTHORS: A/Cherepakhin, M. A.; B/Kakurin, L. I.; C/Ilina-Kakuyeva, Y. I.; D/Fedorenko, G. T.

CORP: Joint Publications Research Service, Arlington, VA. AVAIL.CASI

SAP: Avail: CASI HC A02/MF A02 In its Space Biol. and Aerospace Med., No. 2, 1977 (JPRS-69045) p 87-91 (SEE N77-23721 14-51)

CIO: USSR Transl. Into ENGLISH From Kosm. Biol. Aviakosm. Med. (Moscow), 1977-- P 64-68

MAJS: /*Bioastronautics/*Electric Stimuli/*Muscular Tonus/*Physical Exercise

MINS: / Hypotonia/ Muscular Strength/ Myoelectric Potentials/ Weightlessness

ABA: S.M.

ABSTRACT: The efficacy of electrostimulation of muscles combined with physical exercise, as well as without exercise, was evaluated. Bed rest was the model of weightlessness. The Tonus-2 apparatus was used for electrostimulation. Two series of studies were pursued, each lasting 7 weeks. The subjects stayed in bed in an antiorthostatic position. Muscular atrophy is prevented by means of electrostimulation; however it does not prevent deconditioning of the cardiovascular system. Endurance training, combined with electrostimulation, elicited a distinct preventive effect.

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76N10739# ISSUE 1 PAGE 97 CATEGORY 54 ***RPT#***: AD-A011545 AMRL-TR-73-54 ***CNT#***: AF PROJ. 7184 75/02/00 108 PAGES UNCLASSIFIED DOCUMENT

TITLE: Human force capabilities for operating aircraft controls at 1, 3, and 5 GZ TLSP: Final Report

AUTHORS: A/Kroemer, K. H. E.

CORP: Aerospace Medical Research Labs., Wright-Patterson AFB, OH. AVAIL.CASI

SAP: Avail: CASI HC A06/MF A02

CIO: United States--

MAJS: /*Aircraft Instruments/*Human Performance/*Man Machine Systems

MINS: / Aircraft Control/ Anthropometry/ Biodynamics/ Muscular Strength/ Physical Work/ Physiological Tests/ Statistical Analysis

ABA: DTIC

ABSTRACT: The maximum isometric forces adult male subjects could exert at eight locations of hand-operated aircraft controls were measured at 1, +3 and +5gz. Forces were measured in two vertical and four to eight horizontal directions. Selected anthropometric dimensions were obtained on the subjects and compared with those from the 1967 USAF anthropometric survey of flying personnel. Summary statistics including the mean, standard deviation, coefficient of variation, symmetry, kurtosis, and selected percentiles, are presented for each of the 60 force exertion measures.

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75N27765*# ISSUE 18 PAGE 2306 CATEGORY 54 ***RPT#***: NASA-TT-F-16468 ***CNT#***: NASW-2483 75/07/00 6 PAGES UNCLASSIFIED DOCUMENT

TITLE: The space watch in Salyut as on the earth --- physical training and the effects of spaceflight stress on cosmonaut performance

AUTHORS: A/Zheleznov, N.

CORP: SCITRAN, Inc., Santa Barbara, CA. AVAIL.CASI

SAP: Avail: CASI HC A02/MF A01

CIO: Ussrwashington NASA Transl. Into ENGLISH From Gudok (USSR), 9 Jul.-- 1975 P 4

MAJS: /*Astronaut Performance/*Cosmonauts/*Physical Exercise/*Salyut Space Station/*Space Flight Stress

MINS: / Aerospace Medicine/ Health/ Psychomotor Performance/ Psychophysiology/ Training Devices/ Weightlessness

ABA: Author

ABSTRACT: Medical-biological experiments carried out onboard Salyut space station are described. The equipment used to train the cosmonauts is briefly discussed.

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75N14363* ISSUE 5 PAGE 566 CATEGORY 52 74/11/00 13 PAGES UNCLASSIFIED DOCUMENT

TITLE: Skylab crew health - Crew surgeons' reports

AUTHORS: A/Hordinsky, J. R.

CORP: National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX. In its Proc. of the Skylab Life Sci. Symp., Vol. 1 p 61-73 (SEE N75-14358 05-51)

CIO: United States--

MAJS: /*Aerospace Medicine/*Clinical Medicine/*Health/*Skylab Program/* Spacecrews

MINS: / Bioinstrumentation/ Drugs/ Motion Sickness/ Physical Exercise/ Physical Fitness/ Space Flight Feeding/ Weightlessness

ABA: Author

ABSTRACT: A physician was designated as the Crew Surgeon for each of the three manned Skylab missions. He was responsible for the health of the Skylab crewmembers and their families, the development and use of the Inflight Medical Support System, the preflight medical examination and arrangement of all crew medical-related activities, and the postflight coordination of medical activity on board the recovery ship and afterwards at the NASA-Lyndon B. Johnson Space Center. From a clinical point of view, all of the physiological and psychological responses noted in the Skylab missions were either self-limiting or represented work-around problems requiring minimal counteraction. As such, these changes do not preclude extending man's duration in zero-gravity for longer periods of time.

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74N34572# ISSUE 24 PAGE 2913 CATEGORY 5 ***RPT#***: PB-233100/7 DHEW(NIOSH)-74-109 NIOSH-TR-211-74 74/05/00 33 PAGES UNCLASSIFIED DOCUMENT

TITLE: An instrument for testing isometric strength and endurance ***TLSP***: Final Report

AUTHORS: A/Wasserman, D. F.; B/Germann, T.; C/Goulding, D. V.; D/Pizzo, F.

CORP: National Inst. for Occupational Safety and Health, Cincinnati, OH. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Bioinstrumentation/*Muscular Strength/*Physical Fitness/*Physiological Tests
MINS: / Biometrics/ Fatigue (Biology)/ Human Performance/ Physical Exercise
ABA: GRA
ABSTRACT: A technical description is given of a versatile instrumentation system designed to obtain, monitor, and process human static strength and isometric endurance data. The system includes in-house designed mechanical and electronic apparatus as well as commercially available apparatus. Examples of the system's use with human subjects are presented.

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74N32530*# ISSUE 22 PAGE 2648 CATEGORY 4 ***RPT#***: NASA-CR-140224 ***CNT#***: NAS9-14134 74/06/30 33 PAGES UNCLASSIFIED DOCUMENT
TITLE: Program to study optimal protocol for cardiovascular and muscular efficiency --- physical fitness training for manned space flight ***TLSP***: Progress Report, 1 Jan. - 30 Jun. 1974
AUTHORS: A/Olree, H. D.
CORP: Harding Coll., Searcy, AR. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Cardiovascular System/*Human Body/*Physical Fitness/*Space Flight Training
MINS: / Aerospace Medicine/ Bicycle/ Biometrics/ Ergometers/ Manned Space Flight / Muscular Strength
ABA: Author
ABSTRACT: Training programs necessary for the development of optimal strength during prolonged manned space flight were examined, and exercises performed on the Super Mini Gym Skylab 2 were compared with similar exercises on the Universal Gym and calisthenics. Cardiopulmonary gains were found negligible but all training groups exhibited good gains in strength.

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74N22719*# ISSUE 14 PAGE 1634 CATEGORY 4 ***RPT#***: NASA-TT-F-15586 ***CNT#***: NASW-2481 74/05/00 9 PAGES UNCLASSIFIED DOCUMENT
TITLE: Sense and nonsense about bed rest as a therapeutic measure
AUTHORS: A/Brueschke, G.; B/Haase, J.; C/Herrmann, J.; D/Voigt, D.
CORP: Kanner (Leo) Associates, Redwood City, CA. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A01
CIO: Germanywashington NASA Transl. Into ENGLISH From Deut. Gesundheitsw.-- (West Germany), V. 24, 1969 P 2465-2467
MAJS: /*Bed Rest/*Clinical Medicine/*Therapy
MINS: / Health/ Patients/ Physical Exercise/ Physiological Effects
ABA: Author
ABSTRACT: The practice of undiscriminatingly confining patients to bed is criticized. Confinement to bed causes more physical and psychic complications than other pharmocotherapeutic measures and some of these complications are described. Expanded

opportunities for physical exercise for hospitalized patients are urged with immobilization restricted to the part of the body for which it is absolutely required.

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73N17093* ISSUE 8 PAGE 876 CATEGORY 4 71/00/00 20 PAGES UNCLASSIFIED DOCUMENT

TITLE: An operating environmental health program

UNOC: Medical services of operating environmental health program for industrial workers

AUTHORS: A/Lipana, J. G.; B/Masters, R. L.; C/Winter, W. R. ***PAA***: B/(Lovelace Found. for Med. Educ. and Res.)

CORP: National Aeronautics and Space Administration. Flight Research Center, Edwards, CA. In its Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors p 204-223 (SEE N73-17078 08-04)

CIO: United States--

MAJS: /*Health/*Industries/*Medical Services/*Personnel Management

MINS: / Clinical Medicine/ Physical Fitness/ Therapy

ABA: E.H.W.

ABSTRACT: Some concepts of an operational program for medical and environmental health are outlined. Medical services of this program are primarily concerned with emergency care, laboratory examinations, advice to private physician with patient permission, medical monitoring activities, and suggestions for treatment or control of the malfunction.

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73N17091* ISSUE 8 PAGE 875 CATEGORY 4 72/00/00 23 PAGES UNCLASSIFIED DOCUMENT

TITLE: The NASA-USPHS health evaluation and enhancement program

UNOC: Feasibility of effective exercise and health evaluation and enhancement program for NASA employees

AUTHORS: A/Durbeck, D. C.; B/Heinzelmann, F.; C/Moxley, R. T., Iii; D/Schacther, J.; E/Payne, G. H.; F/Limoncelli, D. D.; G/Fox, S. M., Iii; H/Arnoldi, L. B.

CORP: Public Health Service, Rockville, MD. In NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors p 173-195 (SEE N73-17078 08-04)

CIO: United States--

MAJS: /*Feasibility Analysis/*Health/*Nasa Programs/*Physical Exercise/*Research Facilities

MINS: / Clinical Medicine/ Personnel Management/ Physical Fitness

ABA: Author

ABSTRACT: An exercise program was initiated to assess the feasibility of an on the job health evaluation and enhancement program, as well as to identify the factors which influenced volunteering, adherence, and effectiveness of the program. The program was utilized by 237 of the 998 eligible Federal employees, with a mean attendance of 1.3 days per week. Those who volunteered perceived a need for increased physical activity, felt they had sufficient time to participate, and derived subjective as well as objective benefits. Significant improvements were found in heart rate response to the standard exercise test, body weight, skinfold measurements, and triglycerides. A consistent relationship was found between subjectively reported effects of the program on work, health habits, and behavior, and improvement in cardiovascular function, based on treadmill performance. Numerous

personal and programmatic factors influencing volunteering and participation were identified.

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73N17078*# ISSUE 8 PAGE 874 CATEGORY 4 ***RPT#***: NASA-TM-X-69074 71/00/00 274 PAGES UNCLASSIFIED DOCUMENT

TITLE: Proceedings of the Annual Conference of NASA Clinic Directors, Environmental Health Officials and Medical Program Advisors

UNOC: Conference on occupational and environmental medical services provided to NASA employees

CORP: National Aeronautics and Space Administration, Washington, DC. AVAIL.CASI

SAP: Avail: CASI HC A12/MF A03

CIO: United States Conf. Held At Charleston, S. C., 12-14 Oct. 1971--

MAJS: /*Conferences/*Health/*Medical Services/*Nasa Programs/*Personnel Management

MINS: / Chronic Conditions/ Clinical Medicine/ Mortality/ Myocardial Infarction/ Physical Fitness/ Research Facilities/ Stress (Physiology)

ANN: Data covering techniques and types of services provided to NASA employees in occupational medicine and environmental health are outlined. Specific summaries are given for coronary disease, chronic disease, and occupation induced disorders. Numerous other topics, procedures, and medical equipment are also discussed.

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73N17055* ISSUE 8 PAGE 872 CATEGORY 4 69/00/00 22 PAGES UNCLASSIFIED DOCUMENT

TITLE: Leave taking and overtime behavior as related to demographic, health, and job variables

UNOC: Industrial model for leave and overtime taking behavior of employees exposed to peak work activity periods in relation to health, demography, and job variables

AUTHORS: A/Arnoldi, L. B.; B/Townsend, J. C.

CORP: National Aeronautics and Space Administration, Washington, DC. In its Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors p 73-94 (SEE N73-17048 08-04)

CIO: United States--

MAJS: /*Health/*Human Behavior/*Industrial Plants/*Personnel Management/* Work-Rest Cycle

MINS: / Aerospace Industry/ Aerospace Medicine/ Industrial Management/ Physical Fitness/ Stress (Physiology)/ Work Capacity

ABA: G.G.

ABSTRACT: An intra-installation model is formulated that correlates demographic, health and job related variables to the various types and amounts of leave and overtime taking behavior of employees. Statistical comparison of composite health ratings assigned to subjects based upon clinical criteria and bio-statistical data show that those employees who take the most annual leave as well as sick leave are the ones that have the poorest health ratings; employees who put in the most overtime have also the poorest health records. Stress effects of peak activity periods increase use of sick leave immediately after peak activity but not the use of annual leave.

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72N15094*# ISSUE 6 PAGE 726 CATEGORY 5 ***RPT#***: NASA-TT-F-14096 ***CNT#***: NASW-2035 71/12/00 11 PAGES UNCLASSIFIED DOCUMENT

TITLE: Isometric exercises: A means of preventing muscular atrophy in the treatment of fractures of the extremities

UNOC: Use of isometric exercises as means of preventing muscular atrophy in treatment of fractures of extremities

AUTHORS: A/Atayev, Z. M.

CORP: SCITRAN, Inc., Santa Barbara, CA. AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: Ussrwashington NASA Transl. Into ENGLISH From Vopr. Kurortol.-- Fizioterapii I Lecheb. Fiz. Kult. (Moscow), V. 32, Mar.-Apr. 1967 P 140-145

MAJS: /*Muscular Strength/*Orthopedics/*Physical Exercise

MINS: / Atrophy/ Muscular Tonus/ Nervous System/ Physiological Tests/ Systems Engineering

ABA: Author

ABSTRACT: Tests using static tension of the muscles immobilized from traumas to prevent muscular atrophy were carried out. It was found that isometric tension of the muscles lasting 5 to 7 seconds, used in a general complex of physical exercises, is an effective means of preventing muscular atrophy.

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72N10128# ISSUE 1 PAGE 20 CATEGORY 5 ***RPT#***: AD-724797 S-71-1056 ***CNT#***: N00014-66-C-0051 PROJ. IM-62410105072 71/05/01 33 PAGES UNCLASSIFIED DOCUMENT

TITLE: Research and development prototype for machine augmentation of human strength and endurance: Hardiman 1 project

UNOC: Prototype for machine augmentation of human strength and endurance - Hardiman project ***TLSP***: Summary Progress Report, Jan. 1970 - Apr. 1971

AUTHORS: A/Makinson, B. J.

CORP: General Electric Co., Schenectady, NY. ***CSS***: (Specialty Materials Handling Products Operation.) AVAIL.CASI

SAP: Avail: CASI HC A03/MF A01

CIO: United States Sponsored In Part By Army--

MAJS: /*Man Machine Systems/*Musculoskeletal System/*Prototypes/*Servomechanisms

MINS: / Manipulators/ Muscular Strength/ Physical Fitness

ABA: Author (GRA)

ABSTRACT: The implementation of the Hardiman powered exoskeleton concept was carried to the point where a prototype unit, consisting of 30 hydraulically powered, servo-controlled joints were fabricated and mechanically assembled. One of the arm assemblies was previously operated and has met basic design objectives under test. The Leg and Girdle System was also completed and has gone through partial testing of its twelve servo-controlled joints.

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71N16399# ISSUE 6 PAGE 802 CATEGORY 4 ***RPT#***: AD-714190 USAMRL-886 70/08/05 20 PAGES UNCLASSIFIED DOCUMENT

TITLE: Serial isometric fatigue functions with variable intertrial intervals

UNOC: Effects of repeated maximal isometric exertions with various intertrial intervals on fatigue function and determining relationship between strength and relative decrement

AUTHORS: A/Caldwell, L. S.
CORP: Army Medical Research Lab., Fort Knox, KY. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Fatigue (Biology)/*Muscular Strength/*Work-Rest Cycle
MINS: / Human Performance/ Physical Exercise/ Physiological Tests/ Stress (Physiology)

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70N43049# ISSUE 24 PAGE 4455 CATEGORY 4 ***RPT#***: AD-710593 AMRL-TR-69-9 70/05/00 33 PAGES UNCLASSIFIED DOCUMENT
TITLE: Human strength - Terminology, measurement, and interpretation of data
UNOC: Terminology, measurement, and data interpretation of human strength
AUTHORS: A/Eberhard Kroemer, K. H.
CORP: Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, OH. AVAIL.CASI
SAP: Avail: CASI HC A03/MF A01
CIO: United States--
MAJS: /*Human Performance/*Muscular Strength/*Physiological Tests
MINS: / Data Reduction/ Human Factors Engineering/ Muscles

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70N28622# ISSUE 14 PAGE 2513 CATEGORY 4 ***RPT#***: JPRS-50492 70/05/11 9 PAGES UNCLASSIFIED DOCUMENT
TITLE: Hypokinesia in modern man
UNOC: Effects of hypokinesia in modern man and need for optimal regimen of physical exercise and rest
AUTHORS: A/Smirnov, K. M.
CORP: Joint Publications Research Service, Washington, DC. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A01
CIO: Ussr Transl. Into English From Gig. Sanit. /Ussr/, No. 2, 1970 P 74-78--
MAJS: /*Hygiene/*Physical Exercise/*Relaxation (Physiology)
MINS: / Cardiovascular System/ Health/ Human Body/ Muscular Function

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69N11740# ISSUE 2 PAGE 225 CATEGORY 4 68/10/28 8 PAGES UNCLASSIFIED DOCUMENT
TITLE: Analysis of movements at different organizational levels of life
UNOC: Problems of decreased muscular strength and motor coordination under prolonged space flight stress
AUTHORS: A/Rozenblyum, D. Ye.
CORP: Joint Publications Research Service, Washington, DC. AVAIL.CASI
SAP: Avail: CASI HC A02/MF A03 IN ITS SELECTED TRANSL. FROM AEROSPACE MED. 28 OCT. 1968 P 206-213 /SEE N69-11701 02-04/
CIO: Ussr Presented At The 2d All-Union Conf. On Aerospace Med., Moscow, May-- 1966
MAJS: /*Muscular Strength/*Space Flight Stress
MINS: / Aerospace Medicine/ Efferent Nervous Systems/ Long Term Effects/ Muscular Function/ Physical Exercise/ Physiological Factors/ Weightlessness

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69N11733# ISSUE 2 PAGE 224 CATEGORY 4 68/10/28 5 PAGES UNCLASSIFIED DOCUMENT

TITLE: A method of evaluating the accuracy and stability of time-strength reactions in man

UNOC: Manual dynamometer method of evaluating accuracy and stability of human time-strength reactions

AUTHORS: A/Dushkov, B. A.

CORP: Joint Publications Research Service, Washington, DC. AVAIL.CASI

SAP: Avail: CASI HC A01/MF A03 IN ITS SELECTED TRANSL. FROM AEROSPACE MED. 28 OCT. 1968 P 167-171 /SEE N69-11701 02-04/

CIO: Ussr--

MAJS: /*Dynamometers/*Human Reactions/*Muscular Strength/*Time Discrimination

MINS: / Aerospace Medicine/ Circadian Rhythms/ Neuromuscular Transmission/ Physiological Tests/ Space Flight Stress

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4.4 SPORTDiscus

File 48:SPORTDiscus_1962-1997/Jan
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Sets selected:

Set	Items	Description
1	63213	PHYSICAL
2	31526	FITNESS
3	29893	PHYSICAL()FITNESS
4	2766	AEROBIC? ? AND S3
5	439	MUSCULAR()STRENGTH
6	38	4*5
7	1	STRENGTH TRAINING
8	4320	STRENGTH()TRAINING
9	25	4*8
10	780	MEASUREMENT AND S3
11	145	S10 AND (S8 OR S4)
12	47	S8 AND MEASUREMENT
13	2704	FLEXIBILITY
14	682	S13 AND S3
15	37	S14 AND MEASUREMENT
16	500	COMPARISON AND S3
17	11	S16 AND S8
18	2	S4 AND EVALUAT?(4W)PROGRAM? ?
19	120	S13 AND S4
20	25	BENEFIT? ? (S) S8
21	50	BENEFIT? ? AND S13
22	48	21-0

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SPORTDiscus
00490771 SPORT RECORD NUMBER: 0402707
TITLE: Strength training in male ballet dancers.
Koutedakis, Y.; Cross, V.; Sharp, N.C.C.
Impulse, v4, n3 , p210-219
July 1996

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 1063-8520
LANGUAGE: English
COUNTRY: 840 United States

ARTICLE NUMBER: 402707
NUMBER OF REFERENCES: 26

ABSTRACT: The authors have examined the effects of a 3-month supplemental strength training program on body composition, hand-grip, and arms/upper-body strength on 15 professional (age 24.1 (plus/minus 5.2) years) male ballet dancers. Subjects were randomly divided into experimental (n=9) and control (n=6) groups. The latter group was involved in no extra exercise apart from dancing, and both groups of subjects were physiologically assessed both in the laboratory and in the gymnasium. At the end of the training program, the experimental group demonstrated a significantly lower percentage of body fat (P less than 0.05) and significant increases in grip strength (P less than 0.01), elbow flexion, extension peak torques (P less than 0.01), and maximal "bench-press" exercise (P less than 0.05). All these increases were very similar to each other, at approximately 15 percent. The experimental group also demonstrated a significant negative relationship (r=-.72, P less than 0.001) between initial strength levels and improvements measured at the end of the training program. No significant changes were demonstrated by the control subjects. In terms of the relatively restricted methods used, it is concluded that (a) appropriate strength training, in addition to normal dance commitments, can lead to improvements in arm/upper-body strength and reduction in body fat, and that (b) weak dancers are more likely than their stronger counterparts to benefit from strength training programs.

DESCRIPTORS: ballet; man; strength; training; body composition
SUBJECT HEADINGS (ENGLISH): 614347 BALLET--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

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SPORTDiscus
00487562 SPORT RECORD NUMBER: 0379244
TITLE: Don't forget the strength component.
Yessis, M.
Fitness and sports review international, v29, n3/4 , p193-197
1994

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0275-598X
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 379244

DESCRIPTORS: aerobic training; endurance; cross-training; strength; training; aerobic capacity
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING;

974200 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--AEROBIC TRAINING

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SPORTDiscus
00487541 SPORT RECORD NUMBER: 0379222
TITLE: Dumbbells in aerobics classes.
Siff, M.C.
Fitness and sports review international, v29, n3/4 , p134-135
1994

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0275-598X
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 379222

DESCRIPTORS: aerobic training; hand weights; energy expenditure
SUBJECT HEADINGS (ENGLISH): 974200 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--AEROBIC TRAINING; 613347 AEROBIC DANCE--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

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SPORTDiscus
00481899 SPORT RECORD NUMBER: 0391061
TITLE: Benefits of high-intensity strength training.
Wescott, W.L.
American fitness quarterly, v14, n4 , p24-25;32
Jan 1996

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0881-2121
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 391061
NUMBER OF REFERENCES: 7

DESCRIPTORS: strength; training; theory; training load
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING

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SPORTDiscus
00475891 SPORT RECORD NUMBER: 0386779
TITLE: Children and adolescents in sport: physiological considerations.
Reilly, T.; Stratton, G.

Sports exercise and injury, v1, n4 , p207-213
Oct 1995

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Intermediate
ISSN: 1351-0029
LANGUAGE: English
COUNTRY: 826 United Kingdom
ARTICLE NUMBER: 386779
NUMBER OF REFERENCES: 59

ABSTRACT: In this paper children's participation in sport is considered from a physiological perspective. Research into paediatric exercise has grown over recent years, but there still exists a dearth of literature in this area. The issues addressed in this paper reflect the nature of the evidence about the effects of exercise on children. Evidence to date suggests that physical exercise interacts with growth to positively promote skeletal health as well as general health in the majority of children. However, little is known about the effects of exercise on health in later life. There is also some evidence to suggest that intensive participation in organized sport may increase the incidence of injury in children. There is a substantial body of evidence that suggests that fundamental sex differences in performance exist, with boys generally outperforming girls. However, such differences tend to fluctuate before, during, and after puberty, and cannot be wholly attributed to biological factors. The aerobic system is more efficient in children compared to anaerobic capacities, although habitual physical activity in children trends to be too low to elicit training effects on the cardiorespiratory system. Children's recovery from physical exertion also seems to be quicker than that found in adults. Strength training has little anabolic effect pre-puberty, as most strength gains at this stage are a result of more efficient neural pathways and may be similar between girls and boys. The neuromuscular system in amenable to enhancing physical skills from an early age, although this is specific to the sport in question. The development of children's motor skills through play and structured sport is unequivocally support. Physiological differences between adult and child sports participants are apparent and intense participation in organized sport training needs to be carefully considered against other demands of childhood. Trianing programmes for children should take into account the specific physiological requirements of the growing child and should not be diluted verisions of adults' programmes. Finally, the growing interest in research into paediatric exercise should begin to unravel some of the more tenuous issues related to the child's participation in exercise and sport in the near future.

DESCRIPTORS: child; adolescent; participation; exercise; physical fitness;

child development; physiology
SUBJECT HEADINGS (ENGLISH): 978125 PHYSIOLOGY--CHILDREN AND ADOLESCENTS; 971200 PERCEPTUAL MOTOR PROCESSES--GROWTH AND DEVELOPMENT

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SPORTDiscus
00472930 SPORT RECORD NUMBER: 0383810
TITLE: The supplemental benefits of strength training for aerobically active postmenopausal women.
Morgan, A.L.; Ellison, J.D.; Chandler, M.P.; Chodzko-Zajko, W.J.
Journal of aging and physical activity, v3, n4 , p332-339
Oct 1995

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 1063-8652
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 383810
NUMBER OF REFERENCES: 16

ABSTRACT: This study examined the supplemental benefits of strength training in aerobically active postmenopausal women. Eighteen women (61-71 yrs) who had been participating in regular aerobic exercise for the preceding 8 months were randomly assigned to control (n = 9) and experimental (n = 9) groups. Both groups continued aerobic exercise 3 times a week for the 8-week training period. In addition, the experimental group performed 3 sets (8-12 repetitions) of standard knee extension and flexion exercises at 80 percent of their 1-repetition maximum (1-RM). In the experimental group, highly significant increases in knee flexion and extnesion strength were observed. No changes in strength were noted in the control subjects. There were no significant changes in body composition for either group. The data suggest that aerobically active older individuals can greatly increase strength with resistance training, which is consistent with recent recommendations that resistance training should be used to supplement aerobic exercise.

DESCRIPTORS: strength; training; woman; aged; exercise; physical fitness
SUBJECT HEADINGS (ENGLISH): 978600 WOMEN--PHYSIOLOGY; 978025 PHYSIOLOGY--AGING AND AGED; 902920 TRAINING METHODS--STRENGTH TRAINING

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SPORTDiscus
00469226 SPORT RECORD NUMBER: 0379798
TITLE: Strength training in the elderly to enhance health status.
Hurley, B.
Medicine, exercise, nutrition and health, v4, n4 , p217-229

July/Aug 1995

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 1057-9354
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 379798

NOTES: References: p. 224-229.
NUMBER OF REFERENCES: 203

ABSTRACT: The loss of muscular strength, muscle mass, and bone mass with age have important implications for health status as well as functional abilities. Properly designed strength training (ST) programs can safely increase strength and muscle mass in older men and women. The effect of ST on many important risk factors for age-related diseases and on the prevention or treatment of disabilities has recently been studies. Some examples of these factors include a loss of joint range of motion (flexibility), low bone mineral density (BMD), osteoarthritis, abnormal lipoprotein-lipid profiles, hypertension, glucose intolerance, insulin resistance, a low resting metabolic rate, and a slow gastrointestinal transit time. There is no evidence that ST alone will improve flexibility in major muscle groups among the elderly. The decline in muscle strength and muscle mass with age or inactivity is associated with the loss of BMD and possible bone fractures. There is now evidence that heavy-resistance ST can increase regional BMD in older men. This finding is not consistent in either premenopausal or postmenopausal women; however, a recent study suggests that ST can prevent age-related losses of BMD in postmenopausal women. There are many studies on the effects of ST on blood lipoprotein-lipid profiles and resting blood pressure in young and middle-aged subjects, but not in the elderly. There is no evidence that ST changes risk status for coronary heart disease (CHD) through its effect on blood lipid profiles or blood pressure, but there are no well-controlled studies using older subjects with hyperlipidemia and/or hypertension. There is a consistent improvement in insulin action following short-term ST, which can result in an improvement in glucose tolerance. In this context, ST is just as effective as aerobic exercise training. Both total body and regional fat-free mass are increased and total body and regional fat mass are reduced in older men as a result of a total-body ST program. However, a recent study has raised some uncertainty about whether the increased fat-free mass constitutes changes in muscle mass. Nevertheless, these findings, along with a new report that ST reduces intra-abdominal fat in older women, have important health implications. Gastrointestinal (GI) transit time slows with age and is associated with an increased prevalence of constipation, diverticulosis, and colon cancer. One preliminary report

indicates that ST accelerates gastrointestinal transit time

DESCRIPTORS: strength; health; flexibility; aging; review; bone density; training
SUBJECT HEADINGS (ENGLISH): 904075 AGED--PHYSICAL FITNESS - PROGRAMS; 972100 AGED--PHYSICAL FITNESS; 978025 PHYSIOLOGY--AGING AND AGED

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SPORTDiscus
00465215 SPORT RECORD NUMBER: 0375192
TITLE: Psychosocial benefits of prepubescent strength training.
Faigenbaum, A.D.
Strength and conditioning, v17, n2 , p28-32
Apr 1995

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 1073-6840
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 375192

NOTES: Special section: Strength training for special populations.
NUMBER OF REFERENCES: 35

DESCRIPTORS: review; social psychology; weight training; puberty; adolescent; boy; girl
SUBJECT HEADINGS (ENGLISH): 905090 CHILDREN AND ADOLESCENTS--SOCIAL PSYCHOLOGY

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SPORTDiscus
00462311 SPORT RECORD NUMBER: 0372113
TITLE: Youth lacrosse players can benefit from strength training programs. II.
Blaz, J.
Lacrosse magazine, v18, n7 , p58-59
Nov/Dec 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0194-7893
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 372113

NOTES: Continued from, Lacrosse magazine 18(6), Sept/Oct 1994, 66-67.

DESCRIPTORS: lacrosse; adolescent; strength; weight training; program
SUBJECT HEADINGS (ENGLISH): 570347 LACROSSE--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

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SPORTDiscus
00460003 SPORT RECORD NUMBER: 0369547
TITLE: Youth lacrosse players can benefit from strength training programs.
Blaz, J.
Lacrosse magazine, v18, n6 , p66-67
Sept/Oct 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0194-7893
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 369547

NOTES: Fitness.

DESCRIPTORS: adolescent; lacrosse; strength; weight training; program
SUBJECT HEADINGS (ENGLISH): 570347 LACROSSE--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

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SPORTDiscus
00458414 SPORT RECORD NUMBER: 0367371
TITLE: Perceived benefits of strength training for youth participants as determined by orthopedic surgeons.
Michaud, P.
Eugene, Ore. Microform Publications, Int'l Institute for Sport and Human Performance, Univ. of Oregon
2 microfiches (113 fr.) : negative, ill.; 11 x 15 cm.
1994

DOCUMENT TYPE: Microform Thesis RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
LANGUAGE: English
COUNTRY: 840 United States
CLASSIFICATION NUMBER: UO94 149-150

NOTES: Thesis (M.S.) - Springfield College, 1993; includes bibliography (leaves 97-101).

ABSTRACT: An increase in youth sport injuries has occurred due to the increased participation in youth sport programs. Strength training may be

an affective way to reduce athletic injuries. However, there is concern about whether prepubescent athletes should strength train because this type of training may place too much stress on the body. Orthopedic surgeons deal with these types of injuries and their opinion on whether the prepubescent athlete should strength train, the type of strength training that should be performed, the possible reasons why prepubescent athletes should not strength train, and the perceived benefits of strength training are valuable. Three hundred and fifty questionnaires were sent to randomly selected orthopedic surgeons in the New England area. Seventy-six questionnaires were returned and analyzed by twelve one-way chi-saquares. Orthopedic surgeons did not agree on whether prepubescent athletes should strength train; however, of those orthopedic surgeons who believed prepubescent athlete should strength train, 98(percent) preferred the use of the child's own body weight as a strength training method. Of those orthopedic surgeons who believed prepubescent athletes should not strength train, 75(percent) thought that epiphyseal plate injuries could occur during strength training. Ninety percent of the orthopedic surgeons who preferred that the prepubescent athlete strength train believed that a decrease in overuse injuries was a possible benefit of strength training. In conclusion, among orthopedic surgeons the controversy of whether prepubescent athletes should strength train remains; however, of those orthopedic surgeons who believe prepubescent athletes should strength train, free weights, machines, body weight, and rubber tubing are preferred methods of strength training and the perceived benefits of a decrease in overuse injuries and increase in muscle mass may be attained.

DESCRIPTORS: strength; training; child; attitude inventory; survey; orthopedics; physician
SUBJECT HEADINGS (ENGLISH): 905130 CHILDREN AND ADOLESCENTS--TRAINING AND CONDITIONING; 972200 CHILDREN AND ADOLESCENTS--PHYSICAL FITNESS; 975340 CHILDREN AND ADOLESCENTS--PHYSICAL FITNESS - PROGRAMS

FILE SEGMENT: International Indexing Contribution

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SPORTDiscus
00458376 SPORT RECORD NUMBER: 0367333
TITLE: Comparison of acute heart rate and blood pressure responses among isometric, isotonic, and isokinetic exercise.
Hui, S.C.
Eugene, Ore. Microform Publications, Int'l Institute for Sport and Human Performance, Univ. of Oregon
2 microfiches (167 fr.) : negative, ill.; 11 x 15 cm.
1994

DOCUMENT TYPE: Microform Thesis RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced

LANGUAGE: English
COUNTRY: 840 United States
CLASSIFICATION NUMBER: UO94 68-69

NOTES: Thesis (M.S.) - Springfield College, 1992; includes bibliography (leaves 135-153).

ABSTRACT: The purpose of this study was to compare the acute heart rate (HR) and blood pressure (BP) responses among isometric (IM), isotonic (IT), and isokinetic (IK) exercise when the submaximal level of exercise intensity was equated by Torque-time index (Tq-t). Tq-t was developed by the investigator in order to equate the intensity of the three forms of exercise, and was the product of the average torque and the duration of exercise. Subjects were 18 healthy males. Right leg extension was chosen for the three forms of resistive exercise. IT exercise was performed on a Hammer leg extension machine, whereas IM and IK exercise were performed on a KIN-COM dynamometer. HR and BP responses were recorded by Polar Vantage XL HR monitor and Astropulse-10 electronic BP monitor, respectively. BP responses were taken from the left arm throughout the testing. Rate pressure product (RPP) was calculated by dividing the product of HR and SBP by 1000. The Valsalva maneuver was not allowed throughout the testing. HR, SBP, DBP, and RPP of IM exercise were significantly (p (less than) .001) lower than IT and IK exercise. SBP and RPP of IT exercise were significantly (p (less than) .001) greater than IK exercise. However, no differences (p (greater than) .05) were found between IT and IK exercise in terms of HR and DBP responses. In summary, submaximal IM exercise elicits the lowest cardiac responses than submaximal IT and IK exercises.

DESCRIPTORS: heart rate; blood pressure; isometric training; isotonic training; isokinetic training; variance
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 975550 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--ISOMETRIC, ISOKINETIC AND ISOTONIC TRAINING; 979400 PHYSIOLOGY - CARDIOVASCULAR--HEMODYNAMICS

FILE SEGMENT: International Indexing Contribution

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SPORTDiscus
00455389 SPORT RECORD NUMBER: 0364217
TITLE: Physical and performance characteristics of successful high school football players.
Williford, H.N.; Kirkpatrick, J.; Scharff-Olson, M.; Blessing, D.L.; Wang, N.Z.
American journal of sports medicine, v22, n6 , p859-862
Nov/Dec 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0363-5465
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 364217
NUMBER OF REFERENCES: 25

ABSTRACT: The purpose of this investigation was to determine the performance and physiologic characteristics of a 'successful' American high school football team, and to compare the present values with values reported for other groups of high school, college, and professional players. For descriptive purposes, players were divided into two groups: backs (N=8) and lineman (n=10). Maximal aerobic power (VO2max) was determined from a maximal treadmill test, and body composition was evaluated by hydrostatic weighing. Maximal strength values were evaluated by one-repetition maximum bench press and squat rest; the sit-and-reach test was used to measure flexibility. Speed and power were evaluated by a vertical jump and a 36.6-meter sprint. Results indicate that compared with other groups of college and professional players, as the level of competition increases so do height, weight, and fat-free weight of the players. Similar maximum oxygen consumption values were found for the present group when compared with other groups of these players. From the strength and power standpoint, football players at all levels are becoming stronger. Incorporation of strength training programs has greatly improved strength and performance profiles of football players at all levels of competition.

DESCRIPTORS: football; secondary school; achievement; skill; strength; aerobic capacity; comparative study; body composition
SUBJECT HEADINGS (ENGLISH): 560123 FOOTBALL--PHYSICAL FITNESS; 560127 FOOTBALL--PHYSIOLOGY

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SPORTDiscus

00455273 SPORT RECORD NUMBER: 0363976
TITLE: Effect of aerobic and strength training on pain tolerance, pain appraisal and mood of unfit males as a function of pain location.
Anshel, M.H.; Russell, K.G.
Journal of sports sciences, v12, n6 , p535-547
Dec 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0264-0414
LANGUAGE: English
COUNTRY: 826 United Kingdom

ARTICLE NUMBER: 363976

NOTES: This research was funded by the Australian Sports Commission.
NUMBER OF REFERENCES: 30

ABSTRACT: The purpose of this study was to examine the effect of aerobic and strength conditioning on pain tolerance, pain appraisal and mood as a function of upper and lower limb pain location. Unfit males (n=48) were randomly assigned to one of four groups: aerobic training, strength training, combined aerobic and strength training, and a 'no training' (control) group. The fitness regimens consisted of exercising at least three times per week for 12 weeks. Pain tolerance and appraisal and mood were ascertained before the treatment (baseline), and after 6 and 12 weeks. Statistical analyses using MANOVA indicated that the presence of aerobic training increased upper limb pain tolerance but was also linked to a more severe pain appraisal compared with the absence of aerobic training. Aerobic work also improved vigour while decreasing fatigue, tension and depression. Strength training had no influence on pain tolerance and positive mood states, but increased depression. Lower limb pain tolerance was unaffected by the treatments.

DESCRIPTORS: aerobic training; man; physical fitness; emotion; pain tolerance; pain
SUBJECT HEADINGS (ENGLISH): 972920 PHYSICAL FITNESS--PSYCHOLOGY; 988625 PSYCHOLOGY--PAIN

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SPORTDiscus
00452415 SPORT RECORD NUMBER: 0360986
TITLE: The effect of moderate resistance weight training on peak arm aerobic power.
Swensen, T.; Mancuso, P.; Howley, E.T.
International journal of sports medicine, v14, n1 , p43-47
Jan 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0172-4622
LANGUAGE: English
COUNTRY: 280 Germany, Federal Republic of
NUMBER OF REFERENCES: 35

ABSTRACT: The purpose of this study was to examine the effect of moderate resistance weight training (MRWT) on peak arm aerobic power as measured by arm cranking ergometry. Fourteen sedentary college age males, divided equally into two groups, served as subjects. The seven subjects in the MRWT group completed 12, 1-hr bouts of weight lifting over a 4 week period,

exercising on Monday, Wednesday and Friday of each week. Exercise sessions included 3 sets of 10 repetitions of the following lifts: bench press, overhead dumbell press, dumbbell arm curl, and behind the neck pull down. The remaining seven subjects served as a non-training control group, whose purpose was to account for possible learning effects on the arm ergometer test that could distort the statistical relevance of the aerobic power data. These subjects did not serve as a control for the weight training exercises, as the procedures used to determine muscular strength may produce a modest training effect. Peak arm aerobic power and muscular strength, as measured by the one-repetition maximum for each lift, were determined before and after the training program. The average increase in strength for all lifts combined for the trained group was 20.0 percent. They also experienced a 13.4 percent increase in peak arm aerobic power, whereas there was no significant change in this variable for the control group. It is concluded that peak arm aerobic power is enhanced by the changes in muscular strength produced by 4 wks of MRWT.

DESCRIPTORS: weight training; strength; arm; arm ergometry; man
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING

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SPORTDiscus

00451073 SPORT RECORD NUMBER: 0359598
TITLE: Applied physiology of strength and power in old age.
Young, A.; Skelton, D.A.
International journal of sports medicine, v15, n3 , p149-151
April 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Intermediate
ISSN: 0172-4622
LANGUAGE: English
COUNTRY: 280 Germany, Federal Republic of
NUMBER OF REFERENCES: 24

ABSTRACT: The loss of strength and power in old age has important implications for health. Even with healthy elderly people, cross-sectional comparisons imply a loss of strength at some 1.5 percent per year and of power at some 3.5 percent per year (averaged across the age range 65 to 84). On the other hand, healthy, very elderly people are at least as responsive to strength-training as younger adults. It is important to establish whether elderly people derive functional benefit from training-induced improvements in strength and whether laboratory measurements of strength and power might be used to identify those elderly people most at risk of losing important, everyday functional abilities.

DESCRIPTORS: aged; muscle; strength; physiology; aging; activities of daily living; physical fitness
SUBJECT HEADINGS (ENGLISH): 978025 PHYSIOLOGY--AGING AND AGED; 972100 AGED--PHYSICAL FITNESS

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SPORTDiscus
00450971 SPORT RECORD NUMBER: 0359488
TITLE: Effects of exercise training modality on glucose tolerance in men with abnormal glucose regulation.
Smutok, M.A.; Reece, C.; Kokkinos, P.F.; Farmer, C.M.; Dawson, P.K.; DeVane, J.; Patterson, J.; Goldberg, A.P.; Hurley, B.F.
International journal of sports medicine, v15, n6 , p283-289
Aug 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0172-4622
LANGUAGE: English
COUNTRY: 280 Germany, Federal Republic of
NUMBER OF REFERENCES: 41

ABSTRACT: To determine the effects of exercise training modality on glucose tolerance in men with untreated abnormal glucose regulation, 26 untrained men (age 54 plus/minus 9 years; mean plus/minus SD) with eigher non-insulin-dependent diabetes mellitus (N=8), impaired glucose tolerance (IGT) (N=12) or hyperinsulinemia with normal glucose tolerance (N-6) were studied before and after 20 wk of either strength training (ST) (N=8), aerobic (treadmill walk/jog) training (AT) (N-8), or no exercise (control group; N=10). Plasma concentrations of glucose and insulin were measured after a 12-14 hr fast and during a standard oral glucose tolerance test (OGTT) before and after training. The ST program significantly reduced total plasma glucose area (mmol.1-1.120 min-1) under the OGTT curve (1348 plus/minus 251 vs 1190 plus/minus 329, p is less than 0.05), and plasma glucose levels (mmol.1-1) at 60 min, 90 min, and 120 min after glucose ingestion. Strength training also lowered the total plasma insulin area (pmol.1-1.120 min-1) under the OGTT curve (60082 plus/minus 25467 vs 46727 plus/minus 11273, p is less than 0.05) as well as plasma insulin levels (pmol.1-1) at fasting and at 90 min and 120 min after glucose ingestion. All men with IGT (four in each training group) normalized their glucose tolerance following the training. There were no significant differences in OGTT results between ST and AT and no changes were observed in the control group. Thus, strength training improves glucose tolerance and reduces insulin response to glucose ingestion to the same extent as aerobic training in men with abnormalities in glucose regulation.

DESCRIPTORS: aerobic training; exercise; strength; training; insulin;

glucose; man; diabetes; middle age; comparative study
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 974200 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--AEROBIC TRAINING; 983400 PHYSIOLOGY - MUSCLE--METABOLISM

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SPORTDiscus

00448706 SPORT RECORD NUMBER: 0357012
TITLE: The effects of exercise on age and diseases associated with aging.
Lowenthal, D.T.; Kirschner, D.A.; Williams, L.S.; Krumerman, J.
Maccabiah-Wingate International Congress on Sport and Coaching Sciences (2nd : 1993 : Netanya, Israel).
In, Tenenbaum, G.(ed.), Raz-Liebermann, T.(ed.). 2nd Maccabiah-Wingate International Congress on Sport and Coaching Sciences : Proceedings, Netanya (Israel), Wingate Institute, 1993, p.82-101.

DOCUMENT TYPE: Book analytic RECORD TYPE: Abstract INTELLECTUAL LEVEL: Advanced
LANGUAGE: English
COUNTRY: 376 Israel
CLASSIFICATION NUMBER: GV711 31564

NOTES: Includes tables.
NUMBER OF REFERENCES: 89

ABSTRACT: For many people over age 65, the physiological changes of senescence begin to merge imperceptibly with pathologic changes of disease. Dynamic exercise and low-level strength training can reverse some disease processes (hypertension) or make them easier to treat pharmacologically (diabetes mellitus, ischemic heart disease). Aerobic exercise has been shown to favoritably alter coronary artery disease risk factors, such as blood pressure, blood lipids, glucose tolerance, and obesity which, in addition, could be associated with altering the angina threshold. As a result of changes which occur with dynamic and/or resistive training the major risk factors for coronary disease can be attenuated and the quality of life improved. Longevity, based on a recent study of Paffenbarger et al., may be slightly prolonged as a result of exercise performed on a regular basis.

DESCRIPTORS: disease; aged; risk; exercise
SUBJECT HEADINGS (ENGLISH): 972100 AGED--PHYSICAL FITNESS; 955001 DISEASES AND DISORDERS--MALADIES ET TROUBLES; 904001 AGED--PERSONNES AGEES

FILE SEGMENT: International Indexing Contribution

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SPORTDiscus
00447807 SPORT RECORD NUMBER: 0356099
TITLE: Effects of a supervised resistance training program on adolescents and young adults with mental retardation.
Stopka, C.; Limper, L.; Siders, R.; Graves, J.; Goodman, A.; Silverstone, E.
Journal of strength and conditioning research, v8, n3 , p184-187
Aug 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 1064-8011
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 356099
NUMBER OF REFERENCES: 21

ABSTRACT: The purpose of this study was to conduct a program of resistance training for persons with mild to severe mental retardation (MR) to determine what strength gains if any occurred. Twelve individuals with MR, ages 17 to 21, participated in a 30-min resistance training program twice a week for 23 weeks. Approximately 40 to 45 min of aerobics and sport skill activities supplemented each resistance training session to total 75 min of training per session. At the end of the resistance training program, the subjects with MR demonstrated significant absolute and relative strength gains in all tests of bilateral muscular strength (chest press, leg extension, and lat pulldowns) and sit-ups. It was concluded that adolescents and young adults with moderate to severe MR can participate and experience significant improvements through a supervised resistance training program. Therefore such a program should be considered an integral part of the total exercise program for individuals with MR.

DESCRIPTORS: physical fitness; weight training; young adult; adolescent; mental retardation; strength; adaptation
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 906244 DISABLED--TRAINING AND CONDITIONING
HANDICAPPED SUBJECT HEADINGS: 778 Disabilities--Mental retardation--Research; 640 Sports and recreation activities--Weight training

FILE SEGMENT: Disabled Sport Recreation Documentation

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SPORTDiscus
00435847 SPORT RECORD NUMBER: 0343490
TITLE: The weighting game: to lose weight, you should lift weights. But that's only part of it. Our revolutionary 3-step plan shows you how strength training plus good eating and aerobic exercise can change your body in

just six weeks.
Neporent, L.
Shape, v13, n5 , p56-57;121
Jan 1994

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0744-5121
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 343490

DESCRIPTORS: strength; training; weight training; aerobic training; nutrition; program; weight loss
SUBJECT HEADINGS (ENGLISH): 973100 PHYSICAL FITNESS--WEIGHT CONTROL

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SPORTDiscus
00433887 SPORT RECORD NUMBER: 0341460
TITLE: Strength and conditioning for rugby union.
Jenkins, D.
National Strength and Conditioning Association of Australia. Conference (4th : 1992 : Gold Coast. Aust.).
Toowong, Qld. Pro Cam Studio
1 videocassette : sd., col. ; 22 min.
1992

DOCUMENT TYPE: Videotape RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 036 Australia

NOTES: Credits: Presenter, David Jenkins.; Availability: Pro Cam Studio, Level 3 Toowong Tower, Sherwood Rd., Toowong, Qld. 4066 Australia : Format VHS : System PAL.

DESCRIPTORS: rugby union; training; strength; physical fitness; weight training; congress; aerobic capacity; periodization
SUBJECT HEADINGS (ENGLISH): 574347 RUGBY UNION--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

FILE SEGMENT: International Indexing Contribution

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SPORTDiscus
00433168 SPORT RECORD NUMBER: 0340730
TITLE: Strength training benefits White Sox pitcher McDowell.

National Strength & Conditioning Association journal, v15, n4 , p50-54
July/Aug 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0744-0049
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 340730

NOTES: NSCA interview.

DESCRIPTORS: strength; training; Chicago White Sox; McDowell, J.; man; pitching; United States; baseball
SUBJECT HEADINGS (ENGLISH): 544347 BASEBALL--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING; 544273 BASEBALL--TECHNIQUES AND SKILLS - PITCHING

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SPORTDiscus
00420064 SPORT RECORD NUMBER: 0327318
TITLE: Can the older participant benefit from strength training?
Huntington, R.
American fitness quarterly, v12, n1 , p12;16
Apr 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0881-2121
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 327318

DESCRIPTORS: middle age; aged; strength; training; aging
SUBJECT HEADINGS (ENGLISH): 972100 AGED--PHYSICAL FITNESS; 902920 TRAINING METHODS--STRENGTH TRAINING; 972735 PHYSICAL FITNESS--MIDDLE AGED

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SPORTDiscus
00413572 SPORT RECORD NUMBER: 0320393
TITLE: Changes in physical fitness profile in female basketball players during the competitive season including explosive type strength training.
Hakkinen, K.
Journal of sports medicine and physical fitness, v33, n1 , p19-26
Mar 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0022-4707
LANGUAGE: English
COUNTRY: 380 Italy
ARTICLE NUMBER: 320393
NUMBER OF REFERENCES: 16

ABSTRACT: Ten female basketball players served as subjects in order to examine changes in a physical fitness profile during a 22-week official competitive season. Specific explosive type strength training (1-2 sessions per week) was utilized throughout the season. The present findings showed that the entire competitive season led to no systematic changes in the maximum oxygen uptake (from 48.0 plus/minus 6.6 to 47.0 plus/minus ml.kg-1.min-1), in anthropometric characteristics or in maximal isometric force of the leg extensor muscles (from 2567 plus/minus 490 to 2622 plus/minus 747 N). However, significant increases occurred during the season both in the average power output during the first 15 s work in an anaerobic jumping test and in the maximal vertical jumping heights in the squat jump (from 21.7 plus/minus 2.3 to 24.2 plus/minus 2.4 cm) and in the counter movement jump (from 24.9 plus/minus 2.6 to 26.3 plus/minus 2.9 cm). A considerable change occurred also in the shape of the isometric force-time curve of the leg extensor muscles so that the times to produce submaximal force level shortened. The individual changes during the competitive season both in the power output and in the times of rapid force production correlated negatively with the individual initial values recorded before the season. The present findings suggest that the prolonged competitive season in the present female basketball players seemingly placed sufficient demands on the athletes in energy production through aerobic processes to maintain their level of VO2max. The increases observed in explosive performance characteristics may in part be explained by the low initial level recorded before the season. On the other hand, the explosive type strength training utilized may have helped to overcome possible interfering effects of the overall volume of the training and competitive aerobic demands over the competitive season.

DESCRIPTORS: physical fitness; strength; training; woman; basketball; aerobic capacity
SUBJECT HEADINGS (ENGLISH): 546123 BASKETBALL--PHYSICAL FITNESS; 546127 BASKETBALL--PHYSIOLOGY

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SPORTDiscus
00410946 SPORT RECORD NUMBER: 0317459
TITLE: Physiological changes in male basketball players in year-round strength training.
Groves, B.R.; Gayle, R.C.

Journal of strength and conditioning research, v7, n1 , p30-33
Feb 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 1064-8011
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 317459
NUMBER OF REFERENCES: 6

ABSTRACT: This study evaluated the possible benefits of year-round strength training for male intercollegiate basketball players. Eight players were evaluated four times (T1-T4) during a 12-month period. Test items included body weight, body composition, the Margaria-Kalamen Stair Test, vertical jump, and 1-RM bench press. The repeated measures ANOVA technique was used to test for significant differences across test scores. Percent body fat consistently decreased over time, while body weight decreased from T1 to T2 and then gradually returned to the T1 level by T4. This shift toward a higher percent lean body mass might explain a 27.5-lb mean 1-RM bench press gain over the same time period. Correlational analyses indicated that the positive relationship of weight to strength decreased from r=0.33 to r=0.05, indicating that size is less of a predictor of strength when strength training supplements traditional basketball training. Vertical jump and stair test mean scores did not change significantly. Results suggest there are physical and physiological benefits associated with year-round strength training for male intercollegiate basketball players, although control data were not available.

DESCRIPTORS: physiology; basketball; man; strength; periodization; training
SUBJECT HEADINGS (ENGLISH): 546127 BASKETBALL--PHYSIOLOGY

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SPORTDiscus
00406406 SPORT RECORD NUMBER: 0312706
TITLE: Strong evidence for the strength-training benefits.
Brehm, B.A.
Fitness management, v9, n1 , p25-26
Jan 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
ISSN: 0882-0481
LANGUAGE: English
COUNTRY: 840 United States

ARTICLE NUMBER: 312706

DESCRIPTORS: strength; training; woman; aged; health
SUBJECT HEADINGS (ENGLISH): 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING; 972100 AGED--PHYSICAL FITNESS

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SPORTDiscus
00402302 SPORT RECORD NUMBER: 0308490
TITLE: New methods for training evaluation and planning.
ORIGINAL LANGUAGE TITLE: Nuove metodologie per la valutazione e la programmazione dell'allenamento.
Bosco, C.
SDS, Rivista di cultura sportiva, v10, n22 , p13-22
July/Sept 1991

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
LANGUAGE: Italian
COUNTRY: 380 Italy
ARTICLE NUMBER: 308490
NUMBER OF REFERENCES: 20

ABSTRACT: In the treatment of muscle-skeletal injuries as well as in the planning of physical fitness or training programs, the improvement of muscle function is generally evaluated on the basis of "pre and post" treatment or training comparison. In the past, both isometric or isokinetic apparatus have been utilized extensively in spite of the fact that it is rather difficult to assess dynamic functions with either isometric or isokinetic muscle activation. The most natural activation patterns of muscle work is ballistic. That means that large changes of acceleration occur during the range of movement, that is clearly very different from what occurs during isokinetic activation. An electromechanical apparatus (Ergopower-Bosco system) was therefore developed to enable the measurement of the displacement of the load by a subject during the work performed with strength machines or with abarbell in function of the time needed to produce the work. The equipment allows to calculate the average and peak forces, mechanical work, average and peak power, the time needed to reach the peak power.

DESCRIPTORS: strength; training; method; evaluation
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING

FILE SEGMENT: International Indexing Contribution; Translated From Original Language

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SPORTDiscus
00400789 SPORT RECORD NUMBER: 0306932
TITLE: Everyday benefits of strength training.
Rock, M.
In, The new fitness formula of the 90's: a compilation of 12 points of view...Excelsior, Minn., National Exercise for Life Institute, 1990, p. 125-131.

DOCUMENT TYPE: Book analytic RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
CLASSIFICATION NUMBER: GV546 29008

DESCRIPTORS: training; strength
SUBJECT HEADINGS (ENGLISH): 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING

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SPORTDiscus
00400249 SPORT RECORD NUMBER: 0306389
TITLE: Cardiac rehabilitation following myocardial infarction: a practical approach.
Todd, I.C.; Wosornu, D.; Stewart, I.; Wild, T.
Sports medicine, v14, n4 , p242-259
Oct 1992

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0112-1642
LANGUAGE: English
COUNTRY: 554 New Zealand
ARTICLE NUMBER: 306389
NUMBER OF REFERENCES: 83

ABSTRACT: The first essential factor for good rehabilitation is patient education. Where patients have been given adequate information concerning their condition and treatment there is a high level of patient satisfaction and greater compliance. During the in-hospital period, the staff who are caring for the patient are constantly changing and while there is a role for all to educate the patient, the use of a cardiac liaison sister provides a continuity throughout the early recovery period to ensure that the education process is adequate. The use of written material and both audio and video tapes is also helpful. The use of exercise training is the second vital ingredient for adequate rehabilitation. Traditional training programmes have been hospital based and have used mainly aerobic exercise. However, home based programmes should not be discounted where they may be

more economical, more convenient, and improve patient compliance. Similarly, circuit training with weights have been shown to improve aerobic endurance and muscle strength. It is conceivable that strength training may gain acceptance in future programmes. Current guidelines suggest that 30 to 60 minutes of exercise training 2 to 3 times per week for 3 months is a reasonable approach, benefits may be gained from other regimens including much shorter periods of daily exercise. The clear benefits of exercise training relate to its peripheral effects, which lead to reduction in heart rate and systolic blood pressure during exercise, reducing myocardial oxygen demand. Meta-analysis of exercise rehabilitation programmes suggests that they produce a 20 percent reduction in mortality over a 3-year post infarct period. The serious risks of exercise training are small. However, one has to accept that there is a transient increase in the risk of cardiac arrest during exercise, although habitual exercise is associated with an overall reduction in risk of cardiac arrest. The proven benefits of cardiac rehabilitation are such that all hospitals practising coronary care should aim to provide the minimum of a cardiac liaison sister to improve patient education and a simple exercise regimen to aid recovery.

DESCRIPTORS: review; exercise; counseling; rehabilitation; method; myocardial infarct
SUBJECT HEADINGS (ENGLISH): 956450 CARDIOVASCULAR DISEASES--MYOCARDIAL INFARCTION

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SPORTDiscus
00400122 SPORT RECORD NUMBER: 0306261
TITLE: Propulsion forces as a function of intensity for weightlifting and vertical jumping.
Garhammer, J.; Gregor, R.
Journal of applied sport science research, v6, n3 , p129-134
Aug/Sept 1992

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 306261
NUMBER OF REFERENCES: 20

ABSTRACT: Four Olympic-style weightlifters and six athletes from other sports volunteered to perform maximal and submaximal vertical jumps with countermovement and/or snatch lifts on a Kistler force plate to compare the kinetics of the two activities at different levels of effort. Parameters studied included maximum vertical ground reaction force generated during a snatch lift or jump for both maximal and submaximal efforts and force duration at magnitudes greater than 50, 80 and 90 percent of max during the

propulsion phase of each activity. Results indicated that in both activities, as the level of performance (intensity) increased, maximal propulsion force magnitudes generally decreased, whereas the duration of force at higher percentages of maximum increased. Qualitative similarities in the temporal pattern of vertical ground reaction force for each activity were observed in both unweighting and propulsion phases. Use of a double knee bend lifting technique accounted for an unweighting phase during the snatch lifts. Data indicated that the athletes used adjustments in temporal pattern of propulsive force application, rather than an increase in the magnitude of force generated for maximal versus submaximal efforts in both activities. Athletes who require improved jumping ability may benefit from utilizing Olympic lifting movements as part of their strength training program due to the applied overload and the similarities found between the propulsive force patterns of each activity.

DESCRIPTORS: comparative study; kinetics; propulsion; weightlifting; snatch; vertical jump
SUBJECT HEADINGS (ENGLISH): 762027 WEIGHTLIFTING--BIOMECHANICS

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SPORTDiscus
00398547 SPORT RECORD NUMBER: 0304672
TITLE: How exercise can benefit older patients. A practical approach.
Barry, H.C.; Rich, B.S.E.; Carlson, T.R.
Physician and sportsmedicine, v21, n2 , p124-126;129-130;133-134;137-140
Feb 1993

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0091-3847
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 304672
NUMBER OF REFERENCES: 19

ABSTRACT: Physical activity has both preventive and therapeutic benefits for the frail elderly, and the ultimate goal is improved quality of life. The greatest impact on functional capacity comes from physiologic changes that affect mobility. Walking programs and flexibility and strength training can prevent muscle weakness and impaired gait and balance, which are risk factors for falls in the elderly. In addition, changes in functional capacity can result in greater independence in daily living. Physical activity also provides therapeutic benefits for patients who have arthritis or dementia.

DESCRIPTORS: exercise; physical fitness; aged; quality of life; walking; motivation

SUBJECT HEADINGS (ENGLISH): 972100 AGED--PHYSICAL FITNESS

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SPORTDiscus

00384750 SPORT RECORD NUMBER: 0290510

TITLE: The effects of an off-season strength and conditioning program on starters and non-starters in women's intercollegiate volleyball.

Fry, A.C.; Kraemer, W.J.; Weseman, C.A.; Conroy, B.P.; Gordon, S.E.; Hoffman, J.R.; Maresh, C.M.

Journal of applied sport science research, v5, n4 , p174-181
Nov/Dec 1991

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 290510
NUMBER OF REFERENCES: 26

ABSTRACT: Fourteen female NCAA Division I collegiate volleyball players were monitored during a 12-week off-season strength and conditioning program. Physical characteristics (mean plus/minus standard deviation) included: age, 19.6 plus/minus 0.6 years; height, 171.9 plus/minus 6.8 centimeters; weight, 64.3 plus/minus 7.0 kilograms. Training included resistance exercise, plyometrics, aerobic endurance exercise and on-court volleyball practice. At the beginning of the study, starters (ST, n = 6) were compared with non-starters (NST, n = 8), and were found to be faster, more flexible and stronger. ST were still stronger when one-repetition maximum (1 RM) values were corrected for fat-free mass (FFM). Ten subjects completed the 12-week strength and conditioning program and participated in the post-training tests. ST and NST responded similarly to the training program for all physical and performance tests. Significant improvements were observed dor FFM, sport-specific peak and mean isometric force, vertical jump (VJ), shoulder flexibility, 1 RM strength and 1 RM/FFM for the bench press, military press, squat and hang power clean, and isokinetic leg extension torque at 1.05 and 3.14 rads'sec-1. Furthermore, two-mile run times and sit-up performance (in 60 seconds) also improved. Significant decreases were observed for VJ endurance. Over the course of the training program, the relationship between 1 RM strength and FFM decreased, while shoulder flexibility was increasingly related to sport-specific isometric strength. Isokinetic testing did not reflect the magnitude of changes in 1 RM tests. Thus, while differences appear to exist in physical characteristics between starters and non-starters, it was shown that most physical and performance variables for ST and NST can be improved with a comprehensive strength and conditioning program for female collegiate volleyball players.

DESCRIPTORS: volleyball; strength; training; woman; flexibility; vertical jump; sprinting; speed; anthropometry; comparative study
SUBJECT HEADINGS (ENGLISH): 588123 VOLLEYBALL--PHYSICAL FITNESS; 902920 TRAINING METHODS--STRENGTH TRAINING

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SPORTDiscus
00382114 SPORT RECORD NUMBER: 0287822
TITLE: Circuit weight training. Repercussions on muscle strength and maximal oxygen uptake.
ORIGINAL LANGUAGE TITLE: Les circuits de musculation: repercussions sur la force musculaire et la consommation maximale d'oxygene.
Poumarat, G.; Dabonneville, M.
Science et motricite, n9 , p35-42
dec 1989

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Intermediate
ISSN: 0984-2586
LANGUAGE: French
COUNTRY: 250 France
ARTICLE NUMBER: 287822
NUMBER OF REFERENCES: 38

ABSTRACT: Using circuit weight training for the development of physical fitness is quite usual. It is important to evaluate the effect of this training method on the muscular and cardiorespiratory systems. The comparative studies of investigations devoted to this subject allowed to say that the results are closely related with experimental conditions. For studies using a circuit weight training as described by Morgan and Adamson in 1953, we can observe an improvement in muscle strength and in Vo2 max. So we can assume that this training method is appropriate to improve fitness.

DESCRIPTORS: weight training; circuit training; muscle; strength; aerobic capacity; adaptation; physical fitness
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 902835 TRAINING METHODS--CIRCUIT TRAINING; 983700 PHYSIOLOGY - MUSCLE--STRENGTH AND ENDURANCE

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SPORTDiscus
00367888 SPORT RECORD NUMBER: 0273327
TITLE: Health- and performance-related potential of resistance training.
Stone, M.H.; Fleck, S.J.; Triplett, T.; Kraemer, W.J.
Sports medicine, v11, n4 , p210-231
Apr 1991

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0112-1642
LANGUAGE: English
COUNTRY: 554 New Zealand
ARTICLE NUMBER: 273327
NUMBER OF REFERENCES: 193

ABSTRACT: Regular physical activity can improve cardiovascular fitness and may reduce the likelihood and debilitating effects of cardiovascular disease. Weight-training has generally been believed to have limited value in modifying risks of cardiovascular disease. Effects shown of resistance training on parameters associated with cardiovascular fitness and disease include: heart rate decreases for maximal work and recovery from short term weight-training, increased ventricular mass, and increased ventricular wall and septum thickness. Studies suggest that myocardial hypertrophy resulting from resistive training can be accompanied by positive myocardial adaptations. Blood pressure response considerations to resistive training include: similarity of resistive exercise peak response to other forms of high intensity exercise, highest blood pressures occur at or near exhaustion during maximum lifts, training appears to reduce the exercise blood pressure. Given the blood pressure responses caution is required for individuals with cardiovascular disease. Studies of high-volume weight-training indicate that small to moderate increases in aerobic power can occur in relatively short periods of time. The mechanisms by which weight-training increases VO2max is unclear. Resistive training may produce positive changes in serum lipids with the volume of training being the dependent factor. Cross-sectional and longitudinal studies of bodybuilders suggest that weight-training may beneficially alter glucose tolerance and insulin sensitivity. It appears that weight-training can increase short term high intensity endurance without a concomitant loss in performance. Resistive training increases power output and performance. Body composition has important relationships to cardiovascular fitness, strength and flexibility. It is likely that it can be affected and controlled by use of large body mass during exercise depending on training volume.

DESCRIPTORS: review; weight training; physical fitness; strength; cardiovascular system
SUBJECT HEADINGS (ENGLISH): 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING; 902920 TRAINING METHODS--STRENGTH TRAINING

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SPORTDiscus
00361740 SPORT RECORD NUMBER: 0267025
TITLE: Strength-training benefits.
Durrett, A.

Idea today, v7, n3 , p16
Mar 1989

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 267025

DESCRIPTORS: weight training
SUBJECT HEADINGS (ENGLISH): 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING

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SPORTDiscus
00352618 SPORT RECORD NUMBER: 0257612
TITLE: Overtraining and strength training.
Fleck, S.; Coffey, D.
Australian Coaching Council
Elite Coaches Seminar (2nd : 1988 : Canberra, Aust.).
(Canberra) Impact Images
1 videocassette : sd., col. ; 62 min.
1989

DOCUMENT TYPE: Videotape RECORD TYPE: Abstract INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 036 Australia

NOTES: Credits: Presenter, Steve Fleck ; producer, Dennis Coffey.; Availability: Format VHS : System PAL.
SERIES: Elite Coaches Seminar series.

ABSTRACT: Doctor Steve Fleck presents workshop sessions on overtraining and strength training at the Second Elite Coaches Seminar, 1988. He provides statistics and case studies to support the effects of overtraining and the benefits of strength training. Doctor Fleck makes practical suggestions regarding the scheduling of training and designing a weight training program to suit a specific sport and to meet individual needs.

DESCRIPTORS: coaching; congress; strength; training; overtraining; weight training; Australia
SUBJECT HEADINGS (ENGLISH): 900000 COACHING--ENTRAINEMENT; 950001 MEDICINE--MEDECINE

FILE SEGMENT: International Indexing Contribution

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SPORTDiscus

00350209 SPORT RECORD NUMBER: 0255090
TITLE: Strength training for wheelchair users.
Davis, G.M.; Shephard, R.J.
British journal of sports medicine, v24, n1 , p25-30
Mar 1990

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 0306-3674
LANGUAGE: English
COUNTRY: 826 United Kingdom
ARTICLE NUMBER: 255090
NUMBER OF REFERENCES: 21

ABSTRACT: Sedentary adult males with spinal lesions, all habitual wheelchair users, were allocated to exercise (n=11) and control (n=4) groups. A Cybex II dynamometer was used to assess peak power, average power, total work and muscular endurance for elbow flexion/extension, shoulder flexion/extension and shoulder abduction/adduction at five angular velocities, on recruitment and after eight and 16 weeks of forearm ergometer training (three days/week). Small sub-groups of the exercised subjects were assigned to high or low intensity endurance effort (70 of 40 per cent of maximal oxygen intake) and long or short training sessions (40 or 20 minutes per session). Despite the aerobic nature of the activity, gains of average power were registered by the two muscle groups most involved in the ergometer task (shoulder extension and elbow flexion). In keeping with current theories of training, gains were largest with prolonged, high intensity activity at angular velocities approximating those adopted during training.

DESCRIPTORS: strength; training; paraplegia; spinal disease; non-athlete; physical fitness; evaluation
SUBJECT HEADINGS (ENGLISH): 906244 DISABLED--TRAINING AND CONDITIONING; 902920 TRAINING METHODS--STRENGTH TRAINING
HANDICAPPED SUBJECT HEADINGS: 640 Sports and recreation activities--Weight training; 820 Disabilities--Paraplegia

FILE SEGMENT: Disabled Sport Recreation Documentation

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SPORTDiscus

00346708 SPORT RECORD NUMBER: 0251295
TITLE: Strength training and determinants of VO2max in older men.
Frontera, W.R.; Meredith, C.N.; O'Reilly, K.P.; Evans, W.J.
Journal of applied physiology, v68, n1 , p329-333

1990

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Advanced
ISSN: 8750-7587
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 251295
NUMBER OF REFERENCES: 34

ABSTRACT: The purpose of this study was to determine the effects of strength training in cardiopulmonary function and components of the oxygen transport chain in healthy older men. Twelve males aged 60-72 years underwent twelve weeks of strength conditioning of flexors and extensors of each knee with eight repetitions per set, three sets per session and three sessions per week at 80 percent of the one repetition maximum (1RM). No changes were noted in hemoglobin concentration, pulmonary function, plasma volume, erythrocyte volume or total blood volume, while biopsies of the vasins lateralis muscle showed increases in mean fibre area, capillaries per fibre and citrate synthase activity but no change in fibre type distribution. The results suggest that the increase in leg cycle VO2max in older men may be caused by adaptations in oxidative capacity as well as increased mass of the trained muscles.

DESCRIPTORS: exercise; man; aged; arm ergometry; bicycle ergometry; training; aerobic capacity; strength; oxygen consumption
SUBJECT HEADINGS (ENGLISH): 972100 AGED--PHYSICAL FITNESS; 978025 PHYSIOLOGY--AGING AND AGED

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SPORTDiscus
00337111 SPORT RECORD NUMBER: 0241314
TITLE: A sample weight training program for youth sports coaches.
Wilson, D.J.
Spotlight on youth sports, v11, n3 & 4 , p4-5
Fall 1988/Winter 1989

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 241314

NOTES: Second of two-part series.
NUMBER OF REFERENCES: 1

ABSTRACT: This is a two part series on the structure and function of

muscle and the application in strength training. Part one focuses on the anatomical, physiological and biomechanical properties associated with muscular strength. The aim is to aid understanding of these principles, essential in designing an appropriate weight training program. Part two discusses the application of the above reference to a strength program for young athletes, 14 years and older. Pre workout and post workout routines are given as well as sample stretching and weight training programs aided by full explanation of techniques, body benefit and objectives, allowing individual modification.

DESCRIPTORS: coach; weight training; program; adolescent
SUBJECT HEADINGS (ENGLISH): 975890 PHYSICAL FITNESS - PROGRAMS AND ACTIVITIES--WEIGHT TRAINING

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SPORTDiscus
00335776 SPORT RECORD NUMBER: 0239958
TITLE: Start them early.
Channell, S.
National Strength & Conditioning Association journal, v11, n2 , p16-17
Apr/May 1989

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Basic
ISSN: 0744-0049
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 239958

ABSTRACT: A background discussion of the practicalities of beginning weight training at the age of 13-14 years. The article focuses on intergrating weights into the lifestyle, improving self image and the benefits of strength training for the individual, both physically and mentally.

DESCRIPTORS: training; strength; adolescent; secondary school
SUBJECT HEADINGS (ENGLISH): 905130 CHILDREN AND ADOLESCENTS--TRAINING AND CONDITIONING

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SPORTDiscus
00333131 SPORT RECORD NUMBER: 0236773
TITLE: Position paper on prepubescent strength training.
Journal of osteopathic sports medicine, v2, n3 , p15-20
Sep 1988

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract

INTELLECTUAL LEVEL: Intermediate
ISSN: 0893-3871
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 236773
NUMBER OF REFERENCES: 91

ABSTRACT: Produced by the National Strength and Conditioning Association, this article forms a brief overview of several of the issues commonly discussed in reference to the use of strength training by the prepubescent athlete. Definitions, benefits, gains, injury protection, self-image, improved motor performance, introduction of coaching techniques, risks, acute injuries, chronic injuries, hypertension, competition, equipment, intrusion on free time, personnel, facilities, program and NCAS guidelines are presented briefly and concisely. A full conclusion and summary is provided with comprehensive references and supportive literature.

DESCRIPTORS: strength; training; child; adolescent; safety; injury; prevention
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 905080 CHILDREN AND ADOLESCENTS--SAFETY

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SPORTDiscus
00327543 SPORT RECORD NUMBER: 0229973
TITLE: The use of the VERTEC in power jump training.
Beal, D.P.
American fitness quarterly, v7, n3 , p56-57;59-60;62
Oct 1988

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 229973

ABSTRACT: Another author synonomous with 'Power jump training', Beal has used plyometrics successfully with the 1984 U.S gold medal Volleyball team. Beal is an advocate of the 'Vertec' product, a free-standing vertical jump device consisting of a flat base, a long metal rod and a segmented 'wall' that allows individuals to move parallel indicators up to the height achieved in each jump. No picture is provided of the device however the publication, 'Power Jumping: the Olympic Gold Medal approach to jump training, 1988' also by Beal details this and other pieces of plyometric equipment available. This article deals with an introduction to jump training and the use of the Vertec. Benefits of the equipment are first outlined followed by general jumping procedures detailing specifics,

maximal efforts, timing, measurement, grouping, duration, frequency, strength training and supervision. Nine distinct Vertec exercises are also suggested detailing actions involved, repetitions, sets and additional equipment.

DESCRIPTORS: plyometric training; jump training
SUBJECT HEADINGS (ENGLISH): 902910 TRAINING METHODS--PLYOMETRIC TRAINING

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SPORTDiscus
00305236 SPORT RECORD NUMBER: 0206877
TITLE: What light weights add to your fitness routine: how to use extra pounds safely to improve your exercise results.
Executive fitness, v18, n4 , p1-2
Apr 1987

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 206877

DESCRIPTORS: aerobic dance; ankle weights; hand weights; physical fitness
SUBJECT HEADINGS (ENGLISH): 613347 AEROBIC DANCE--TRAINING AND CONDITIONING - WEIGHT AND STRENGTH TRAINING

FILE SEGMENT: SPORT Bibliography (1987) Volume 16

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SPORTDiscus
00290018 SPORT RECORD NUMBER: 0191478
TITLE: Move over aerobics; endurance, muscle strength are coming back.
Runzheimer, K.
Journal of physical education and program, v81, n9/G , pG16-G17
Oct 1985

DOCUMENT TYPE: Journal article RECORD TYPE: Citation
INTELLECTUAL LEVEL: Basic
LANGUAGE: English
COUNTRY: 840 United States
ARTICLE NUMBER: 191478

DESCRIPTORS: physical fitness; training; endurance; strength
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING

FILE SEGMENT: SPORT Bibliography (1985) Volume 14

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SPORTDiscus

00235837 SPORT RECORD NUMBER: 0136765
TITLE: Year around conditioning for army football: strength training, aerobic endurance, flexibility, nutrition.
Kearin, T.
West Point, N.Y. Leisure Press
127 p. : ill.
c1980

DOCUMENT TYPE: Monograph RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
ISBN: 0-918438-60-8 LC CARD NUMBER: 80-82965
LANGUAGE: English
COUNTRY: 840 United States
CLASSIFICATION NUMBER: GV953.5 18343

DESCRIPTORS: football; physical fitness; exercise; training; strength; flexibility; Army; evaluation; motivation; drug; nutrition
SUBJECT HEADINGS (ENGLISH): 560312 FOOTBALL--TRAINING AND CONDITIONING

FILE SEGMENT: SPORT Bibliography (1984) Volumes 11, 12, & 13

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SPORTDiscus

00226531 SPORT RECORD NUMBER: 0127389
TITLE: Aerobic weight training: the athlete's guide to improved sports performance.
Hatfield, F.C.
Chicago Contemporary Books
ix, 118 p. : ill.
c1983

DOCUMENT TYPE: Monograph RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
ISBN: 0809255332 LC CARD NUMBER: 83-007557
LANGUAGE: English
COUNTRY: 840 United States
CLASSIFICATION NUMBER: GV546.5 15605

NOTES: Includes index.

DESCRIPTORS: Physical fitness; weight training; aerobic training
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING

FILE SEGMENT: SPORT Bibliography (1984) Volumes 11, 12, & 13

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SPORTDiscus

00209320 SPORT RECORD NUMBER: 0110032
TITLE: Runner's world aerobic weight training book. Aerobic weight training book.
Sobey, E.; Burns, G.
Runner's World
Mountain View, Calif. Runner's World Books
ix, 181 p.
1982

DOCUMENT TYPE: Monograph RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
ISBN: 0890372411 LC CARD NUMBER: 82-011315
LANGUAGE: English
CLASSIFICATION NUMBER: RA781.15 13309

NOTES: Bibliography: p. 181.
SERIES: Instructional book, 11.

DESCRIPTORS: Weight training; aerobic training; physical fitness; strength
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING

FILE SEGMENT: SPORT Bibliography (1984) Volumes 11, 12, & 13

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SPORTDiscus

00193049 SPORT RECORD NUMBER: 0093694
TITLE: Quantification of the aerobic component in strength/conditioning programs.
Schmidt, R.J.
National Strength Coaches Association journal 3(2), Apr/May 1981, 40-41.

DOCUMENT TYPE: Journal article RECORD TYPE: Abstract
INTELLECTUAL LEVEL: Intermediate
LANGUAGE: English
ARTICLE NUMBER: 057263
NUMBER OF REFERENCES: 5

ABSTRACT: In order to develop optimal athletic potential it is necessary to develop muscular strength, muscular endurance, cardiorespiratory endurance, flexibility and body composition. Cardiorespiratory endurance is normally the forgotten component in most strength training programs. In this article the author defines aerobic power and describes the biological adaptations which result in the many benefits of aerobic exercise. The factors which should be considered in the development of an aerobics program are outlined with exercise intensity being highlighted as a crucial variable. Various methods for determining the intensity of exercise are presented in accordance with guidelines provided by the American College of

Sports Medicine.

DESCRIPTORS: Aerobic training; oxygen consumption; strength; aerobic metabolism; program
SUBJECT HEADINGS (ENGLISH): 902805 TRAINING METHODS--AEROBIC TRAINING

FILE SEGMENT: SPORT Bibliography (1983) Volumes 9 & 10

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SPORTDiscus
00181565 SPORT RECORD NUMBER: 0082041
TITLE: Isorobics: a better way to fitness.
Useldinger, R.; Richards, L.
Ardmore, Penn. Whitmore Publishing Co.
viii, 99 p.
c1979

DOCUMENT TYPE: Monograph RECORD TYPE: Citation INTELLECTUAL LEVEL: Basic
ISBN: 0874260493 LC CARD NUMBER: 79-18724
LANGUAGE: English
CLASSIFICATION NUMBER: RA781 10509

NOTES: Bibliography: p. 91-97.

DESCRIPTORS: Physical fitness; exercise; isotonic training; isokinetic training; aerobic training; isometric training
SUBJECT HEADINGS (ENGLISH): 902920 TRAINING METHODS--STRENGTH TRAINING; 902805 TRAINING METHODS--AEROBIC TRAINING

FILE SEGMENT: SPORT Bibliography (1980) Volume 5